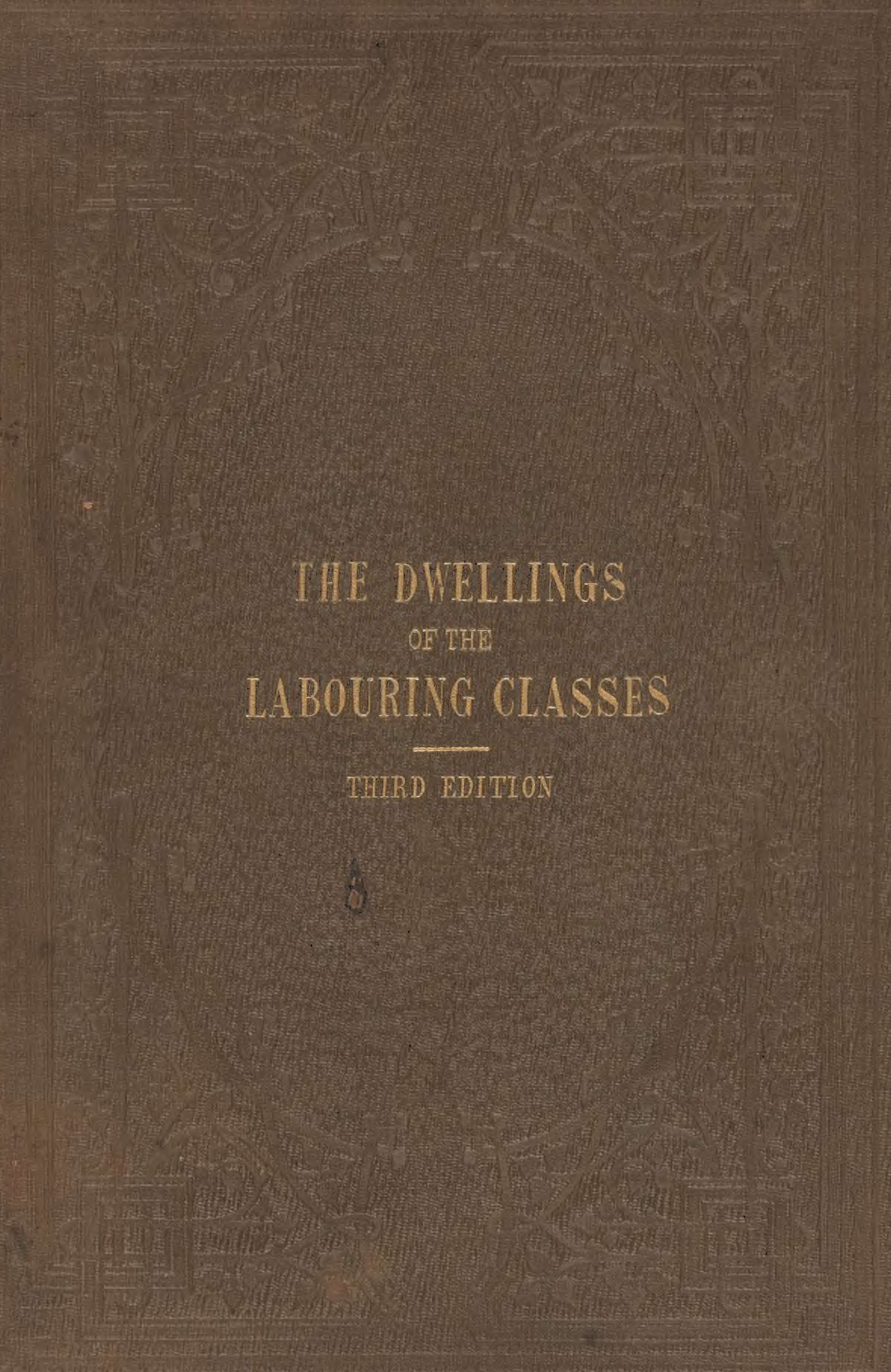

THE DWELLINGS
OF THE
LABOURING CLASSES

THIRD EDITION

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Thomas Sutcliffe Mort's
copy

THE DWELLINGS OF
THE LABOURING CLASSES.

THE DWELLINGS OF THE LABOURING CLASSES,

Their Arrangement and Construction;

ILLUSTRATED BY A REFERENCE TO THE

MODEL HOUSES

OF THE

Society for Improving the Condition of the Labouring Classes,

WITH OTHER BUILDINGS RECENTLY ERECTED:

AND

AN APPENDIX,

CONTAINING

H.R.H. PRINCE ALBERT'S EXHIBITION MODEL HOUSES, HYDE PARK, 1851;

THE MODEL COTTAGES &c. BUILT BY THE WINDSOR ROYAL SOCIETY;

With Plans and Elevations

OF DWELLINGS ADAPTED TO TOWNS, AS WELL AS TO AGRICULTURAL
AND MANUFACTURING DISTRICTS.

BY

HENRY ROBERTS, F.S.A.
FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS,
HONORARY ARCHITECT TO THE SOCIETY FOR IMPROVING THE CONDITION OF
THE LABOURING CLASSES.

THIRD EDITION.

PUBLISHED BY REQUEST, AND SOLD FOR THE BENEFIT OF
THE SOCIETY FOR IMPROVING THE CONDITION OF THE LABOURING CLASSES,
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COVENT GARDEN.

TO HIS ROYAL HIGHNESS

THE PRINCE ALBERT, K.G.

PRESIDENT,

TO HIS GRACE

THE ARCHBISHOP OF CANTERBURY,

AND TO THE OTHER VICE-PATRONS AND VICE-PRESIDENTS,

TO THE RIGHT HONOURABLE

THE EARL OF SHAFTESBURY,

CHAIRMAN,

AND TO MY COLLEAGUES ON THE COMMITTEE

OF THE

SOCIETY FOR IMPROVING THE CONDITION OF THE LABOURING CLASSES,

This Essay

IS RESPECTFULLY INSCRIBED.

SOCIETY FOR IMPROVING THE CONDITION OF THE LABOURING CLASSES,

TO WHICH THE LABOURER'S FRIEND SOCIETY IS UNITED.

INCORPORATED BY ROYAL CHARTER.

Under the Patronage of

HER MOST GRACIOUS MAJESTY THE QUEEN.

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Offices and Committee Room—No. 21, *Exeter Hall.*

THE Society seeks to promote the important objects for which it is constituted by the following means:—

First. By arranging and executing Plans, as Models, for the Improvement of the Dwellings of the Labouring Classes, both in the Metropolis and in the manufacturing and agricultural districts: by establishing the Field Garden and Cottage Allotment System, and also Friendly or Benefit and Loan Societies, upon sound principles, and reporting the results, with a view to rendering them available as Models for more extended adoption.

Secondly. By the formation of County, Parochial, and District Associations, acting upon uniform plans and rules.

Thirdly. By correspondence with Clergymen, Magistrates, Landed Proprietors, and others disposed to render assistance in their respective localities, either individually, or as members of Local Associations.

The following observations having been originally addressed to the scientific body of which the Author is a member, some unavoidable technicalities will, he trusts, be excused by the general reader.

At the request of the Earl of Shaftesbury, and of several gentlemen distinguished for the interest they have taken in the social improvement of the Labouring Classes, the Essay was prepared for publication, with the addition of Notes and an Appendix.

On the demand for a Third Edition, after a circulation of 3000 copies, the Author has revised the whole, as well as added to the Appendix such supplementary matter as further experience enables him to supply, and he hopes that its usefulness will be thereby increased.

The translation into French, made and extensively circulated by order of the Emperor when President of the Republic, was from the First Edition.

London,—*June,* 1853.

CONTENTS.

Royal Institute of British Architects.

ON THE DWELLINGS OF THE LABOURING CLASSES.

By HENRY ROBERTS, *Fellow.*

READ 21ST JANUARY, 1850:
THE EARL DE GREY, K.G., PRESIDENT,
In the Chair.

THE subject now submitted to the consideration of the INSTITUTE OF BRITISH ARCHITECTS is one to which their special attention has not been previously invited, although it was incidentally alluded to by my friend, Mr. Smirke, in the course of the last session.

Much has of late been said and written on the dwellings of the labouring classes; our illustrious patron, the Prince Consort, has emphatically shown that he feels deeply interested in this subject, and has publicly announced* that "these feelings are entirely and warmly shared by her Majesty the Queen," our most gracious Patroness. Still it is probable that but few members of the Institute have given any special attention to those details, which I shall have to bring under your notice; and certainly a yet more limited number have been professionally engaged in a field of labour, which apparently offers little scope for scientific skill, and but few attractive points to an artist's eye. Such was my own case when, between five and six years since, I undertook the duties of Honorary Architect to the Society for Improving the Condition of the Labouring Classes, to whose operations in this department your attention will be hereafter invited.

There appear to be many reasons which should, in an especial manner, commend this subject to the consideration of the architect, besides those which give it so strong a claim on the philanthropist and political economist. A moment's reflection must show that the highest achievements of architecture are accomplished through the instrumentality of the working classes, whose skill and persevering industry conduce as much to the fame of the Architect as the steady valour of the soldier does to weave the crown of victory around the brow of his triumphant General.

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* At the fourth annual meeting of the Society for Improving the Condition of the Labouring Classes, 18th May, 1848, when his Royal Highness presided, and delivered an Address, the electric effect of which extended far beyond the walls of Freemasons' Hall.

I feel assured, then, that this subject will command the patient consideration of the members of the Institute, although it be devoid of those charms which render attractive so many departments of our profession. May we not also hope that it will engage the attention of some who are carrying out as Contractors the designs of the architect. Many of them have in their employ a large number of the working classes, and without pecuniary sacrifice might do much towards securing for those, whose labour is to their employers a source of considerable profit, such dwellings as would greatly conduce to their comfort, and promote the health and good mŏrals of themselves and their families.

It is only the merest fraction of the working classes who, in regard to their dwellings, have it directly within their own power in any way to help themselves. Hence, the greater claim for the kind consideration of those whose position and circumstances give them the opportunity of providing in this respect for their wants, on the sound principle of receiving in return a fair per-centage on the necessary outlay of capital.

In addressing you on the Dwellings of the Labouring Classes, I abstain from all topics of an antiquarian and historical character; I will not occupy your time by describing the caves or the huts in which, at an early period of our history, dwelt the masses of the labouring classes in this country; nor, in order to draw a comparison, need I ask you to explore the classic ruins of other lands, to tread some narrow vicus in the disinterred remains of Pompeii; neither will we stay to inquire whether the labouring classes are, in reference to their dwellings, in a worse condition now than they were one or two centuries since. The remark of Mr. Macaulay on this subject may suffice, when he says, "Of the great body of the people, of those who held the ploughs, who tended the oxen, who toiled at the looms of Norwich, and squared the Portland stone for St. Paul's, very much cannot be said; history was too much occupied with courts and camps to spare a line for the hut of the peasant, or for the garret of the mechanic."

I do not enter into any lengthened detail of the present state of the dwellings in which a very numerous body of the labouring classes are lodged.* My own observations most fully confirm what has been stated over and over again as to the magnitude and wide extent of the wretchedness resulting from their actual condition, which arises from the want of all those arrangements which are calculated to promote the comfort and moral training of a well-ordered family, as well as the utter absence of proper ventilation, efficient drainage, and a good supply of water; together with a system of over-crowding that would not be tolerated in the farm-yard, the stable,

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* "A Lecture on the Unhealthiness of Towns," by Viscount Ebrington, M.P., published by the Health-of-Towns' Association, describes in so lucid and feeling a manner the miseries to which an over-crowded and badly-housed population are subject, and gives in a condensed form so many important statistical facts, that its perusal cannot fail to interest as well as instruct even those who usually shrink from such inquiries.

or even the dog-kennel.* One example may suffice. About four years since, with the desire to obtain ocular demonstration as to the actual existence of such a state of things, I visited with a friend several houses in St. Giles's, the immediate neighbourhood of the Model Lodging House, George-street, to be hereafter described. In one of these houses we found a room about 22ft. by 16ft., the ceiling of which could be easily touched with the hand, without any ventilation, excepting through some half-patched broken squares of glass; here were constantly lodging from forty to sixty human beings, men, women, and children, besides dogs and cats. Further details it is unnecessary for me to describe; their very recital would disgust you.

The pulling down and clearing away of numerous dwellings occupied by the labouring classes, in order to make way for modern improvements, has greatly aggravated these evils, and even the carrying into effect the important requirements of the Health-of-Towns' Bill itself must press heavily on the poor, unless it be connected with the building or fitting-up of improved dwellings.

If it be said that the remarks I have made can alone apply to a metropolitan St. Giles's, or to Saffron-hill, a reference to the reports of the Health-of-Towns' Commission,† or to the more recent and graphic descriptions in the columns of the *Morning Chronicle*, will abundantly show that our provincial towns,‡ our rural villages, and even many of the picturesque cottages which so much enliven the landscape of Great Britain, form no exception to the wretched condition of a large proportion of the dwellings tenanted by our labouring peasantry, artisans, and mechanics. In a provincial town, I lately entered one of three cottages approached by a passage 2ft. 6in. wide, common to the whole of them; in a ground floor room 10ft. 6in. by 8ft., and 5ft. 10in. high, with a triangular loft in the sloping roof, were lodged a husband, a wife, and five children. The out-buildings common to these

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* The following Statistical Report of a house-to-house visitation in the parish of St. George, Hanover-Square, was made in 1842, at the instance of the present Earl of Harrowby. 1465 families of the labouring classes were found to have for their residence only 2174 rooms, and 2510 beds. The distribution of rooms and beds was as follows:—

Dwellings.	No. of Families.
Single room for each family	929
Two " "	408
Three " "	94
Four " "	17
Five " "	8
Six " "	4
Seven " "	1
Eight " "	1
Not ascertained	3
Total	1465

One bed to each family	623
Two " "	638
Three " "	154
Four " "	21
Five " "	8
Six " "	3
Seven " "	1
Dwellings without a bed	7
Not ascertained	10
Total	14

† These invaluable Reports bear ample testimony to the zeal and untiring energy Mr. Chadwick in carrying on the good work to which he has been so long devoted.

‡ Mr. Rawlinson, the Government Inspector under the General Board of Health, assures the author, that he believes there is not a town in Great Britain, with a population of 4000 persons, which does not exhibit a similar scene to that referred to above as witnessed by him in St. Giles's.

cottages I forbear to describe. Yet this is an underdrawn picture of the domiciliary wretchedness which many a dwelling in England, with its boasted civilization, refinement, and wealth, presents. Some have only one room, occupied by a great number of inmates; some have two, three, or four rooms, each occupied by a distinct and often a numerous family; in some cottages, one or more lodgers occupy the same apartment with the family, regardless of age and sex.

Great and widely extended as are these evils, morally, physically, socially, and politically considered, we are happily not without encouragement to hope that through the active operation of Christian principle, combined with an enlightened and well-directed spirit of philanthropic enterprise, as great a change will be effected in the dwellings of the working classes, as that which was brought about in the state of our prisons, mainly through the exertions of the illustrious Howard. England* surely cannot long allow such a contrast to exist between the comparative domiciliary comforts enjoyed by those who have forfeited their freedom as the penalty of crime, and the wretched homes from which at present too many of our labouring population are tempted to escape to the gin palace or the beer shop,†—those very portals of domestic misery and moral ruin.

The *practical view* of the improvement of the dwellings of the labouring classes which I desire to bring under consideration, will be most conveniently taken by first pointing out the general principles, applicable as well in towns as in the country, and afterwards by considering these two descriptions of dwellings separately.

The most humble abodes, whether in a town or in the country, in order to be healthy, must be dry and well ventilated; to secure the former, it is essential that due attention be given to the situation or locality, to the foundation, and to the drainage, as well as to the material of which the external walls and roof are constructed. To secure ventilation, there must be a free circulation of air; a sufficient number and size of openings, and

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* The numerous applications made to the Society for Improving the Condition of the Labouring Classes for plans of their model dwellings, and the constant inquiries received from various parts of the country, prove that the Society has not laboured in vain; whilst it is particularly gratifying to know that our Continental neighbours and Transatlantic brethren are profiting by our example and experience, in carrying out the same plans, modified to suit their own peculiar circumstances.

† Were the amount of evil induced throughout the country by the temptation which these places present to the labouring classes fully ascertained, and the expenses they give rise to for hospitals, for workhouses, for lunatic asylums, for police, with all the other machinery employed for the prevention and punishment of crime, summed up together, they would present an aggregate which, irrespective of the more important moral and social question, could not fail of putting aside at once all considerations of public revenue or private interest. The introduction of the monosyllable "not" in the "licensed to be drunk on the premises" would certainly be a step in the right direction. One instance, of recent occurrence, has strikingly manifested the evils of the present system; no sooner had a model lodging house for single men been opened in an agricultural parish, than a beer-shop was licensed almost opposite to it.

adequate height of the rooms, which I should fix at not less than 7ft. 6in. to 8ft.; in town buildings I have allowed 9ft. from floor to floor. The number and area of the apartments should be in proportion to the probable number of occupants; where intended for families, there should, as a general rule, be not fewer than *three* sleeping apartments, each with a distinct and independent access; no other arrangement can secure a due separation of the sexes. The living room ought not to contain less than 140ft. to 150ft. superficial, and the parents' bed-room should at least measure about 100ft. superficial; in the latter, as a provision for sickness, a fire-place is of much importance. In every room an opening for the escape of vitiated air ought to be made near the ceiling, especially in the smaller bed-rooms for children, where there is no fire-place; in some cases this may be effectively done by carrying up a pipe through the roof bent at the top, or an air flue may be built in the wall.

An entirely satisfactory system of ventilation, applicable to small apartments,—by means of which the vitiated air shall be removed, and an adequate supply of fresh air be introduced, without causing any perceptible current,—appears to be still a desideratum. My experience is certainly unfavourable to the *indiscriminate* use of chimney valves fixed in the ordinary manner.* In some cases, they answer perfectly; in others, it is almost impracticable to prevent the ingress of smoke through the aperture; on this account, I prefer, where practicable, carrying up for some height an independent ventilating flue, which may be 9in. by 4in., or even smaller, and ultimately open into the chimney flue, or into the external air, if there be no chimney flue from the apartment. The most simple and economical ventilator which I have tried for the admission of external air, is fixing in an aperture behind an air brick an iron frame fitted with a sheet of perforated zinc, and having an iron plate hung to close it, with a rack. Perforated Ventilating Glass, Dr. Guy's Ventilators, and Bailie's or Moore's Sliding Ventilators, are valuable when used in appropriate situations.

For the comfort and health of the inmates of every tenement, the protection afforded by an internal lobby or close porch is of importance, as well as the relative position of the doors and fire-places to the living room, which should be so arranged that there may be at least one snug corner free from draught. Where casement windows are used, the great difficulty which is found in the lower class of buildings of rendering them weather tight, renders it desirable that they should invariably be made to open outwards, and be properly secured by stay-bar fastenings. Zinc I have found the most satis-

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* The inconvenience referred to—in the use of these valves, where it does not arise from the throat of the chimney being too large, or from the exit being too much contracted, is by their scientific and benevolent inventor, Dr. Arnott, ascribed to defective workmanship, or want of proper regulation in their use. Eminent physicians testify so strongly in their favour, that the practical difficulty I have experienced is stated with reluctance, and under the impression that it is felt in diminished proportion to the height at which they are fixed above the chimney opening. In low rooms, such a result is obtainable by the branch flue above described.

factory material for casements, and if the quarries are well proportioned and not too large, their effect differs very little from that of lead.

In illustrating the general principles which I would advocate as applicable, particularly to town buildings, it will be convenient now to refer to the dwellings erected by the Society for Improving the Condition of the Labouring Classes. This Society was established in 1844, under the patronage of Her Majesty the Queen, with the Prince Consort as its illustrious President. Influenced by the philanthropic principles so powerfully advocated by their noble chairman, Lord Ashley, and stimulated by his example, the committee of this Society undertook, as one most important branch of their labours, "to arrange and execute Plans as Models for the Improvement of the Dwellings of the Labouring Classes, both in the Metropolis and in the Manufacturing and Agricultural Districts." For the past five years they have been steadily engaged in presenting successive Models of Improved Dwellings adapted to the various circumstances of the Industrial Classes—a work which at the outset of the Society's labours was characterized by one of the most eminent builders in London as "exceedingly complicated, and which could hardly be done well, and so as to make a profit as an investment." Notwithstanding this opinion, and the advice given that the Society should limit itself to offering premiums for plans submitted in competition, and publishing such as might be most approved, it was felt that no description or reasoning, however forcible, no plans or estimates, however suitable and accurate, would be likely to make such an impression on the public as actual experiments, and the demonstration by experience that a fair return might be obtained from an investment judiciously laid out in improving the dwellings of the labouring classes.

With these views, the Society proceeded to build, between Gray's-inn-road and the Lower-road, Pentonville, near Bagnigge Wells, their first set of Model Dwellings* on the only eligible site of ground then offered, and which they had some difficulty in securing, owing to the adverse feeling of parties who apprehended injury to their property from the vicinity of what they regarded as likely to prove a sort of nondescript pile of pauper buildings.

The form of the site, and the unfavourable nature of the foundation for a lofty building, being newly-made ground, in some degree influenced its appropriation to a double row of two-story houses, facing each other, and on three distinct plans, to accommodate in the whole twenty-three families, and thirty single females. In their arrangement, the main object has been to combine every point essential to the health, comfort, and moral habits of the industrious classes and their families, particular attention being paid to *ventilation, drainage, and an ample supply of water.*†

1. Nine of the families occupy each an entire house, with a living-room

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* A view and plan of these buildings is given at pp. 40 & 41.

† Existing regulations of the Metropolitan Water Companies involve the inconvenience and heavy expense of double-sized cisterns, owing to the want of a regular *daily* supply, which, for some reasons, would be preferable to a main always charged.

on the ground-floor, having an enclosed recess, or closet, large enough to receive beds for the youths of the family, two bed-rooms on the upper floor, and a small yard at the back: the rent of these houses is 6*s.* per week.

2. The remaining fourteen families are distributed in seven houses, each family occupying a floor of two rooms, with all requisite conveniences; and as the apartments on the upper floor are approached through an outer door distinct from that leading to the lower floor, their respective occupants are thus kept entirely separate, and both floors are virtually distinct dwellings. The rent paid by each family is three shillings and sixpence per week.

A *wash-house*, with drying-ground, is provided for the occasional use of the tenants of these houses, at a small charge.

3. The centre building on the east side will accommodate thirty widows or females of advanced age, each having a room, with the use of a wash-house common to them all. The rent paid for the rooms is one shilling and sixpence per week. Subsequently, it has been thought by the Committee that this rent should have been fixed at two shillings per week.

Where space will admit of it, some modification in the arrangement of houses built after this general model would be desirable. The Society has published plans in which these alterations are embraced.*

It may be further remarked that the use of hollow brick or tile arches in the construction of the floors in the manner hereafter to be described, would add greatly to the comfort of houses in which one family is lodged above another, and but little, if at all, increase their cost.

In many situations where a few additional feet could be given to the width of the street, a third story, or even a fourth, might with advantage be added to the height of the houses. In such case the access to the upper stories might be from a gallery carried along the back, and approached by one or more external open staircase, similar to the arrangement of the Streatham-street houses, hereafter described; or one staircase might give access to two or three tenements on each floor.† This arrangement would obviate many of the evils to be apprehended from internal staircases common to several families, as well as secure the tenements from liability to window-tax, as it is confidently believed. In some localities an increased rent might be obtained by arranging the ground floor for small shops; the dwellings above being kept entirely distinct, in the manner just described, and of which an illustration will be given hereafter.

Encouraged by the immediate occupation of their first set of buildings, and the approval of the public, manifested by liberal contributions‡ the

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* Plans showing these alterations are given at pp. 43 & 44, and working drawings for such Buildings may be obtained at 21, Exeter Hall.

† Such an arrangement is shown at p. 42 in the lower plan, which was adopted for the Exhibition Model Houses built at the cost of H.R.H. Prince Albert, as will be seen on reference to the Appendix.

‡ In no case has the amount contributed by the public to the several model-houses of the Society been equal to its cost. The revenue, after the gradual payment of the amount borrowed for their completion, and the interest on the same, will be devoted to carrying on the general objects of the Society as prescribed by the Charter.

Society next proceeded to exhibit a Model of an Improved Lodging House for Working Men.

It is difficult for those who have not by personal examination ascertained the state of degradation, both moral and physical, which is exhibited in the vast majority of the ordinary lodging-houses* of the labouring classes, both in the metropolis and in the provincial towns, to imagine the extent of the evil grappled with in this undertaking.

Many of these lodging-houses may truly be described as the very hot-beds of vice and crime,—a disgrace to humanity, a reproach to the Christianity of England; and yet it is in such sinks of iniquity and contamination that the young artisan too often takes up his abode on first arriving in London, or when quitting the paternal roof, and there has every good principle undermined by evil associates, until he becomes a pest of society, and either sinks, through disease and want, into an untimely grave, or forfeits his freedom to the laws of his country.

To show the practicability of effecting a great improvement in the existing lodging-houses, the Society began by taking three lodging-houses in one of the worst neighbourhoods in London—viz., Charles street, Drury-lane.† These they completely renovated, and converted into one house, which has been fitted up with clean and wholesome beds, and all other appurtenances requisite for the health and comfort of eighty-two working men, who pay the same amount as is usually charged in the neighbouring wretched lodging-houses for a single bed—viz., fourpence per night, or two shillings per week, and cheerfully conform to the regulations of the Establishment.‡

In a financial point of view, this experiment is amply remunerative.

The main object of the Society is, not to lower the price, but to improve the quality, of the dwellings, and in no other way to assume the position of rival landlords.

But, however valuable as an experiment, and calculated as a stimulant to produce highly beneficial results, the house in Charles-street cannot be considered as the model of what a lodging-house ought to be. The Committee therefore purchased a piece of freehold ground in George Street, Bloomsbury, surrounded by other lodging-houses, and have built on it a

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* Public attention appears in the first instance to have been generally aroused to the actual state of the lodging-houses in London, by a publication of the London City Missionary Society, entitled "The Lodging-Houses of London," which exhibited such an appalling picture of vice and wretched degradation as to be disbelieved by many who might have found in the Reports of the Health-of-Towns' Commission sufficient to satisfy them that a concealed volcano existed in the very heart of the metropolis.

The Act of Parliament of 1851 for regulating common lodging-houses, introduced by Lord Ashley in the House of Commons, and carried by his lordship, as Earl of Shaftesbury, through the House of Lords, has proved one of the most important means of ameliorating their condition. At the present time (June, 1853) lodging-houses in London alone, occupied by not fewer than 80,000 persons, have been brought under these regulations, which are ably administered by the police, and in all probability the number will shortly be increased to 100,000.

† A view and plan of this building is given at p. 45.

‡ Rules adopted for the general regulation of lodging-houses are given at p. 37.

"Model Lodging-House" for 104 working men,* in which it has been their aim to combine everything deemed essential or valuable in such an establishment—complete ventilation and drainage; the use of a distinct living-room; a kitchen and a wash-house, a bath, and an ample supply of water; separation and retirement in the sleeping apartments; with all those conveniences which, whilst conducing to the health and physical comfort of the inmates, tend to increase their self-respect, and elevate them in the scale of moral and intellectual beings.†

The Plans fully describe the arrangement of the several floors; and the fitting-up of the principal apartments may be thus briefly stated:—The kitchen and wash-house are furnished with every requisite and appropriate convenience; the bath is supplied with hot and cold water; the pantry-hatch provides a secure and separate well-ventilated safe for the food of each inmate. In the pay-office, under care of the superintendent, is a small, well-selected library, for the use of the lodgers. The coffee, or common-room, 33ft. long, 23ft. wide, and 10ft. 9in. high, is paved with white tiles, laid on brick arches, and on each side are two rows of elm tables, with seats; at the fire-place is a constant supply of hot water, and above it are the rules of the Establishment. The staircase, which occupies the centre of the building, is of stone. The dormitories, eight in number, 10ft. high, are subdivided with moveable wood partitions 6ft. 9in. high; each compartment, enclosed by its own door, is fitted up with a bed, chair, and clothes-box. In addition to the ventilation secured by means of a thorough draught, a shaft is carried up at the end of every room, the ventilation through it being assisted by the introduction of gas, which lights the apartment. A ventilating shaft is also carried up the staircase, for the supply of fresh air to the dormitories, with a provision for warming it if required. The washing closets on each floor are fitted up with slate, having japanned iron basins, and water laid on.

As a striking proof of the beneficial results of this improved lodging-house system, it may be stated, that whilst the cholera was ravaging to a fearful extent the filthy and over-crowded receptacles in its immediate neighbourhood, not one case occurred amongst its 104 inmates, and but few of diarrhœa, which speedily yielded to medical treatment.

The Society has recently fitted up in Hatton-garden a lodging-house

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* A view and plans of this building are given at pp. 46—48.

† His Royal Highness Prince Albert, in his address at Freemasons' Hall, 18th May, 1848, said, in reference to this house—"I have just come from the Model Lodging-house, the opening of which we celebrate this day; and I feel convinced that its existence will, by degrees, cause a complete change in the domestic comforts of the labouring classes, as it will exhibit to them, that with real economy can be combined advantages with which few of them have hitherto been acquainted; whilst it will show to those who possess capital to invest, that they may do so with great profit and advantage to themselves, at the same time that they are dispensing those comforts to which I have alluded to their poorer brethren."

for fifty-seven women,* which may be referred to as the completest example of the adaptation and arrangement of an old house with all the conveniences desirable in such an establishment.

The most important of the Society's model buildings is that now to be described. It was felt that the design of a building to accommodate a large number of families on a plan adapted to situations where the value of ground renders it necessary to occupy but a limited space, required, in a more than ordinary degree, the combination of everything worthy of imitation with that durability and rigid economy of construction, which is indispensable in a permanent investment of capital.

The question of lodging a large number of families in one lofty pile of building has been the subject of much discussion, and in reference to it the most contradictory opinions were stated before the Health-of-Towns' Commission. Some thought it the best adapted and most economical plan to provide in one house, with a common staircase and internal passages, sufficient rooms for lodging a considerable number of families, giving them the use of a kitchen, wash-house, and other necessary conveniences, in common; others objected that such an arrangement would lead to endless contentions, and be attended with much evil in cases of contagious disease.

It must be obvious that in many localities where labourers' dwellings are indispensable, it is impossible to provide them with isolated and altogether independent tenements; and therefore, though modified by local and other circumstances, it will be found the general practice in Great Britain, as well as in the large towns on the Continent,† for several families of the working classes to reside in one house.

The important point, then, for consideration, is, in what manner can the advantages of this economical arrangement be retained without the serious practical evils which have been referred to?

In providing for the accommodation of a large number of families in one pile of building, a leading feature of the plan should be the preservation of the domestic privacy and independence of each distinct family, and the disconnexion of their apartments, so as effectually to prevent the communication of contagious diseases. This is accomplished in the model houses for families built in Streatham-street, Bloomsbury,‡ by dispensing altogether with separate staircases, and other internal communications between the different stories, and by adopting one common open staircase leading into galleries

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* Plans of this building are given at p. 46.

† One of the most imposing buildings tenanted by the working classes is the Albergo di Poveri at Naples, which, in its unfinished state, when visited by the author in 1829, contained 2600 inmates; it is six stories high, the upper being used for workshops, wherein persons of different age and sex are employed in weaving, shoe-making, tailoring, and the preparation of coral. The sleeping apartments are remarkably neat; the beds in the daytime fold up in the centre, and are covered with a cloth; above is the name, and by the side a bag for the clothes of the occupier.

‡ Views and plans of these buildings are given at pp. 49—51.

or corridors, open on one side to a spacious quadrangle, and on the other side having the outer doors of the several tenements, the rooms of which are protected from draught by a small entrance lobby. The galleries are supported next the quadrangle by a series of arcades, each embracing two stories in height; and the slate floors of the intermediate galleries rest on iron beams, which also carry the enclosure railing. The tenements being thus rendered *separate* dwellings, and having fewer than seven windows in each, it is confidently submitted are not liable to the window-tax*—which, in a financial point of view, is a consideration of much importance—a saving of at least between seventy and eighty pounds per annum being thus effected on the entire range of buildings.

The plans fully describe the general arrangement of the several floors: that on a larger scale (Appendix, p. 52) exhibits two tenements or sets of apartments with their appropriate fittings, which comprise all the conveniences requisite for a well-ordered family, and include, in addition to the bed-rooms, a provision for an enclosed bed for boys in a closet out of the living-room.

The nature of the foundation rendering excavation to a considerable depth indispensable, a basement story has been formed, with a range of well-lighted and ventilated workshops;† these will doubtless prove a great convenience to some of the tenants, as will also the wash-house and bath provided for their common use, under the control of the superintendent or keeper, for whom an office is placed near the public entrance; to him will probably be also entrusted the retailing to the tenants, at low prices, coals and potatoes, for which ample stowage is provided in the basement.

The floors and roofs of these buildings are rendered fire-proof by arching with tiles or hollow bricks slightly wedge-shaped.‡ They are 6in. deep, 4in. wide, on the top part, 9in. long, $\frac{7}{8}$ths to 1in. thick; the rise of the arches is from $\frac{3}{4}$in. to 1in. per foot on the span, and they are set in Portland cement, in the proportion of one part cement to two parts sharp sand, the tiles being well wetted before being used. The weight of the arch is 37lbs. per foot superficial; levelling up with concrete adds about 33lbs. per foot superficial.

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* An attempt was made to levy this tax, but on an appeal to the Judges the exemption of these houses was established, and since the removal of the window tax, freedom from liability to the substituted *house-tax* has on the same ground been maintained.

† The rooms in the basement story not letting readily for workshops, they were fitted up for families, and quickly taken at weekly rents of 2s. to 4s. per tenement, according to the extent of accommodation.

‡ Tiles resembling the form of a garden-pot, closed at both ends, have long been applied to the turning of floor arches. They appear to have been invented in France, where they are extensively employed for that purpose. The writer used them when building Fishmonger's Hall in 1833. The ceiling of St. George's Hall, Liverpool, presents the finest example of vaulting with hollow bricks. A very interesting description of it was given at the Institute of British Architects last year, by Mr. Rawlinson, C.E., whose skill had been sought in designing and executing this part of the structure after the death of Mr. Elmes, the talented architect of the magnificent building referred to

The arrangement of the building is such as to render the floor and roof arches* a continued series of abutments to each other, excepting at the extremities, where they are tied in with $\frac{7}{8}$in. iron rods, secured to cast-iron or to stone springers; the latter formed with two courses of York stone, between which the tie-rods pass. The roof is levelled with concrete, and asphalted. The floors of the bed-rooms are boarded on joists 2in. square, cut out 1in. on the back of the arch, and secured to two sleepers; the remainder of the floors are in Portland cement, excepting the basement, which is of metallic lava.

In order to test the strength of this somewhat novel application of tile-arches, an experimental arch was turned about 3ft. 2in. wide, 9ft. 6in. between the points of support, and rising 7in. The abutments or springers were secured by two $\frac{7}{8}$in. iron rods, and left for some weeks; pig-iron was then piled on the centre, and the deflection carefully taken as follows:—3 tons, $\frac{1}{8}$in.; 5 tons, $\frac{1}{4}$in.; 6 tons left for twenty-four hours, $\frac{3}{8}$in.; 7 tons, 7 cwt., $\frac{3}{8}$in.; 8 tons, $\frac{3}{8}\frac{1}{16}$in.; 9 tons, 4 cwt., $\frac{5}{8}$in.; 9 tons, 14 cwt., broke down, the tiles cracking first at the ends through which the tension rods passed; this experiment proved that, calculating the greatest total weight 32 cwt., which could be ever placed on such a floor if covered with people at the rate of 120lbs. per foot superficial, it would safely bear four times that weight, but broke down with six times. Owing to the difficulty of obtaining sufficient tiles, some of the narrower arches, of 6ft. to 7ft. span, were turned with the tiles flatways, being 4in. deep, and others with half-brick arches.

The extra cost of rendering this building fire-proof, as well as preventing the communication of sound and all percolation of water between the several floors, by means of the tile arches, beyond the cost of construction with the ordinary combustible floors and roof, as ascertained by comparative tenders, did not exceed about 12*s.* per cent. on the contract for the entire pile of building, which is 7370*l.*; and, in all probability, when a regular demand arises for roof and floor arch tiles, they will be supplied at such a price as to allow of their use without any extra cost.

The Society undertook on the completion of this building, to raise one other pile of model town dwellings, with money placed at its disposal from thanksgiving-offerings† for the removal of the cholera; and with this view

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* Arches constructed of hollow bricks—like all brickwork of slight substance—should not be executed at a season when frost may be expected, and care should be taken that the joints are not washed out by heavy rain; their setting should on no account be let as task-work. A thoroughly solid foundation is indispensable for all buildings where arching enters into the construction. The Appendix contains some further details in reference to hollow bricks, and their application to the dwellings of the labouring classes.

† The raising of this fund is attributable to the following suggestion of the Lord Bishop of London, in a Letter addressed to the Clergy of his Diocese, previous to the day appointed for national thanksgiving for the removal of the cholera, Nov. 15, 1849. His Lordship writes—"I venture to recommend that the alms then collected should be applied to the promotion of some well considered plan for improving the dwellings of the labouring classes. I would not be understood to prescribe the channel through which the collec-

purchased an eligible freehold site in Portpool Lane, Gray's Inn Lane. The Plan of the Buildings, which is given at page 54, exhibits an arrangement adapted to the circumstances of a portion of the labouring classes not provided for in the Society's other model dwellings,* and combines with 20 tenements for a poorer class of families, apartments for 128 single women, and a public wash-house.

As it is my desire to take a comprehensive view of the subject under consideration, and to point out—more especially to the junior members of the Institute—any practical defects in arrangement which experience has brought under my observation, I will proceed to notice some of the principal dwellings for the industrial classes which have been built since the establishment of the Society for Improving the Condition of the Labouring Classes, in 1844.

The first, in point of time, are the lofty and imposing piles of workmen's dwellings raised at Birkenhead,† for 324 families, four stories high, and of fire-proof construction. There is much to commend in this early effort to provide suitable dwellings for the working classes; but in several important points there appears to be such great room for amendment, and experience has so fully confirmed my original impression with reference to the plans of these buildings, that I venture to refer to a Report made on them, under date May 1, 1845, and addressed to Lord Ashley, whose opinion had been requested by an influential gentleman interested in the undertaking.

"The Sub-Committee on Dwellings of the Society for Improving the Condition of the Labouring Classes, have taken into consideration the plans transmitted by your lordship, for the residence of labourers employed on the Birkenhead Docks, and beg to make the following observations respecting them:—

"1st. The width of the proposed avenues is only 18ft., whilst the houses are designed to be nearly 40ft. in height. Under the new Metropolitan Building Act, the width of such avenues ought to be not less than the height of the buildings, 40ft. Waiving, however, the

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tions should be so applied; but I would suggest that, where the funds so raised are not sufficient for carrying out a local scheme for that purpose, they may be safely entrusted to 'The Society for Improving the Condition of the Labouring Classes,' without fear of misapplication or waste. Much good has been already effected by that Society in setting an example of what may be done towards providing the poor with decent and commodious habitations, by an outlay which will ultimately be repaid with interest, both in a social and a pecuniary point of view. It is a remarkable and encouraging fact, that in the dwellings and lodging-houses belonging to the Society there was not one case of cholera, and two only of diarrhœa, which speedily yielded to medical treatment."

* The total amount received from Church collections was about £2500, and of donations direct to the Society, about £2810.

† A plan of two tenements in these buildings is given at p. 52.

application of this Act as a conclusive test, we are of opinion that, with a view to secure good ventilation, and free access for the sun, the width of the avenues should be at least 30ft., more particularly as the disposition of the greater part of them is such as to preclude that thorough circulation of air which would have been obtained by a free and unobstructed opening at each end.

"2nd. The general arrangement of the houses appears to be good; and although the height of the rooms is ample, yet in other respects the scale of building is decidedly less than the Committee can approve. All the rooms are small, particularly those for sleeping, which measure only 9ft. 6in. by 7ft., and 9ft. 6in. by 6ft. It should further be observed, that the want of a provision for the placing a bed in a recess out of the living-room, precludes, in case of the dwelling being occupied by a family, the possibility of a due separation of the sexes.

"In reference to the dust-shaft, the greatest care will be requisite to provide for the escape of gas from the decomposed matter in the dust-cellar, which would otherwise ascend and find its way into the dwelling.

"No specific plan for ventilation being described, it is impossible to offer any opinion on this most important point, but it is highly necessary that some efficient means should be adopted for this purpose, and more particularly for carrying away the noxious products of combustion arising from the gas-light.

"We are,
"Your Lordship's very faithful servants,
"William Denison, Capt. Royal Engineers.
"Henry Roberts, Architect.
"Joseph Toynbee, F.R.S."

These buildings have been completed upwards of three years, and it was with much regret, when visiting Birkenhead in October last, that I found them tenantless, owing doubtless, in a considerable measure, to the suspension of the Dock-works in contemplation when they were erected; yet being within accessible distance to a numerous and increasing working population, I apprehend another cause may be, that the gloomy appearance of the narrow alleys, on the pavement to most of which the sun can never shine, has had a repulsive tendency. At no great distance, a single pile of workmen's houses,—for sixty-four families,—called "Morpeth Buildings," has been erected on the same general plan, consisting of double houses, four stories high, with central staircase, giving access, on each landing, to two sets of apartments. These houses are not fire-proof, but enjoy the advantage of unobstructed light and air; they are near to the occupations of the tenants; are always full; and prove a great boon to the inmates, who willingly pay a rent of 2*s.* 6*d.* per week, with 3*d.* additional for gas-light.

The Metropolitan Association for Improving the Dwellings of the Industrious Classes was incorporated by Royal Charter in October, 1845, and their first range of dwellings, built in the Old Pancras Road,* for the accommodation of 110 families, was opened for reception of the tenants, early in 1848. These buildings—from the designs of Mr. Moffet—present an extended and imposing front of about 226 feet, with advancing wings, and are five stories high. The sub-division into distinct double-houses, with a central stone staircase to each, is similar to that of the Birkenhead buildings. They are not fire-proof, but have the advantage of larger-sized apartments, and unobstructed light and air. The internal staircase arrangement involves them equally in the heavy charge of window-tax, which, on the whole pile of buildings, amounts to 152*l.* 16*s.* per annum. These dwellings have been constantly occupied since their completion, and the most gratifying evidence has been given of the change produced in the health and comfort of the tenants, by their improved and salubrious abodes.

The second undertaking of the Metropolitan Society has been the building, in Spitalfields, of a lodging-house for 234 single men, with dormitories arranged on a similar plan to those in the George-street, Bloomsbury,† lodging-house, opened in 1847; the living-room accommodation is more extensive and costly, as it comprises a coffee-room 45ft. by 35ft., a kitchen 46ft. by 21ft. 9in., a lecture-room 35ft. by 21ft. 9in., and a reading-room 25ft. by 21ft. 9in. This building is just completed, from the designs of Mr. W. Beck; the charge for each lodger has been fixed at 3*s.* per week, whilst that in George-street, Bloomsbury, is only 2*s.* 4*d.* per week; it remains to be seen whether the extra payment beyond 4*d.* per night, the usual charge for lodgings for single men, will be paid for such increased accommodation. It may also be questionable how far the class of men for whom lodgings in such a neighbourhood are chiefly needed, will be really benefited by the luxuries here provided, and which but few men in full employment can have much time for enjoying. It should, however, be observed, that the proximity of this establishment to the spacious range of dwellings for families, building by

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* A plan of two tenements in these buildings is given at p. 53.

† The Sailors' Home, in Well-street, London Docks, must in some respects be considered the prototype of the improved lodging-houses. It was opened in 1835; and the cost of fitting up the last dormitory was defrayed at the sole expense of her lamented Majesty the Queen Dowager, a munificent patroness of the Labouring Classes' Improvement Society. This admirable establishment, which will now lodge 300 inmates, is, with the Destitute Sailors' Asylum in the same street, a monument of the self-denying and devoted energy of the late Captain R. J. Elliot, R.N. As the latter building—to which the writer had the pleasure of acting as honorary architect in 1835—may be useful in suggesting arrangements suitable for a class below that of ordinary labourers, and not within the range of the designs carried out by the Society for Improving the Condition of the Labouring Classes, such as ragged school boys, or nightly lodgers known as trampers, plans of it are given in the Appendix, p. 56. The addition of a second floor would provide for the nightly separation of the sexes in a caravansary lodging-house, a description of building much needed in all our towns, and even in many villages.

the same Association, affords the opportunity of appropriating to the use of the occupants of those dwellings, at fixed hours of the day, some of the accommodation afforded in this building, and thus turning to good account what might otherwise be surplus accommodation.

The internal plan of these dwellings for families is similar in general disposition to those in the Old Pancras Road, the relative position of the door and fire-places in the living-rooms is better than in the latter buildings, but the position of the entrance under the centre of the staircase, from apparent want of height, is unsatisfactory. The construction of the floors, originally intended to be on the ordinary plan, has, since the contract was taken, been changed to the fire-proof plan of Messrs. Fox and Barret.

The Metropolitan Association,* by which these dwellings have been built, is established on the sound, and, indeed, only principle upon which it can be reasonably expected that an extensive improvement in the dwellings of the labouring classes in towns should be effected—viz., that of an investment of capital, with the prospect that, under good management, a fair return of interest on the outlay will be obtained. More can scarcely be expected from a benevolent public than funds sufficient, with careful economy, to effect the important object contemplated by the Society for Improving the Condition of the Labouring Classes—viz., the erection and completion of one model of each description of building required to meet the varied circumstances of the labouring classes, and at the same time the demonstration that such buildings may, with proper management, be made to yield a fair return on the outlay.

In Glasgow, a dwelling-house of four stories, arranged to accommodate thirty-one families, has been built, with a benevolent view, by Mr. James Lumsden. The tenements are ranged on either side of a central passage, which communicates with the common staircase, and is lighted at the ends. Each tenement consists of one apartment, with a single window, two bed-closets, and a scullery, separated from the main compartment by partitions seven feet high. A water-closet, with a dust-shaft, is placed immediately within the entrance door, having no perceptible means for ventilation. Very

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* The claims of this Association on public support were most powerfully advocated in the eloquent address of the Earl of Carlisle at the recent opening of the lodging-house in Spicer-street. "Let it be proved," said his Lordship, "that the act of doing good, in however unpretending and common-place a manner, to large masses of the struggling and impoverished, would pay its own way, and ensure its fair profit; and it would follow that benevolence, instead of being only an ethereal influence in the breasts of a few, fitful and confined in its operations, would become a settled, sober habit of the many; widening as it went, occasioning its own rebound, and adding all the calculations of prudence to all the impulses of generosity."

A well-devised parliamentary enactment, which would facilitate the formation and general management of independent local associations, conducted on the principle of a joint-stock company, with limited liability, would doubtless greatly facilitate the extension of these improvements. At present the expense and difficulty of obtaining a charter operate as a serious barrier. Let these be removed, and there would then be no excuse for corporate and other public bodies declining to take up the subject in real earnest.

questionable as this arrangement must be regarded in a sanitary point of view, it is chiefly referred to as a forcible illustration of the impediment offered by the window-tax to the proper construction of large piles of labourers' dwellings on the ordinary plan of arrangement. In these tenements three windows should have been provided where there is one only.

The policy of continuing a tax which so greatly conduces to augment the evils of an over-crowded dwelling, and at the same time presents a serious barrier to their improvement, by diminishing the fair return from such investments, can scarcely be matter for question.*

Besides the new buildings to which reference has been made, the spirit of improvement has in several places manifested itself by the re-modelling of old buildings,† and fitting them up, as near as circumstances will admit, on an improved and sanitary plan, so as to render them healthy and comfortable abodes. That improvements of this description might be effected to a very great extent, with immense advantage to the working classes, and a handsome remunerative return to those who undertake them with judgment, and who do not shrink from the trouble which they involve, the experience of the Society for Improving the Condition of the Labouring Classes has clearly demonstrated.

In adapting and fitting up old buildings, as well as in erecting new ones, experience has also taught the importance of a judicious selection of the locality, which should not be too far removed from the daily occupations of the expected tenants, nor should they be in close contact with the residences of a much higher class in society.‡

In reference to new buildings for the labouring classes, the most rigid economy of arrangement, consistent with accommodation sufficiently spacious to be convenient and healthy, and the utmost attention to cheapness of construction, consistent with durability§ and comfort, are essential elements of a really good and suitable plan. The Architect should bear in mind that the rents which the working classes usually pay, though exorbitantly high for the wretched accommodation afforded them, will only just yield a fair

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* The removal, since the above was written, of the tax on windows and on bricks is perhaps the most important concession made to the public call for sanitary amelioration.

† The proprietors of old lodging-houses, and of tenements rented by the working classes, have, from self-interested motives, also begun to put their houses in order, and complain that lodgers are now not content without the conveniences and comforts provided for them in the model dwellings. Thus a most wholesome spirit of rivalry has already commenced its leavening influence.

‡ In a provincial city, an improved lodging-house for single men was fitted up, several months since, with every suitable accommodation for between thirty and forty inmates, but has never had above four or five lodgers. This is to be attributed to the locality being too good for the class of persons intended to be benefited; and probably the selection, for a superintendent, of a person formerly in the police, has had a repulsive tendency.

§ The interior fittings of such buildings should be as indestructible as possible; iron pipes should be used instead of lead, and the ironmongery generally be of special strength and simplicity.

return for the outlay on buildings constructed for their express use, and fitted up with all the conveniences which it is desirable they should possess. Any expenditure on unnecessary accommodation, which involves an increase of rent beyond that usually paid by the occupants of such a class of dwellings, appears to be at least hazardous, and may jeopardize the whole or a portion of the interest to be fairly expected from the investment.

The remaining branch of the subject, on which I have now to speak more particularly, is that of labourers' dwellings in agricultural or country districts; and whether we regard it in its moral and social relations—in its bearing on national stability or prosperity, or even in the infinitely less important, though more artistic, light in which it may be viewed as associated with the attractive charms of English landscape, much might be said. Assuming, however, the great necessity for improvement, and proposing as my chief object practical utility, I will not dilate on these topics, but merely offer the passing remark, that fitness of style, justness of proportion, and internal comfort, are perfectly consistent with picturesque effect, and with that strict economy of construction which is indispensable in cottage architecture adapted for the masses of the people.

The attention of landed proprietors has often been directed to the necessity for the improvement of labourers' cottages, and in not a few instances the entire aspect of a village and a neighbourhood has in this respect been completely changed by the well-directed efforts of a single landlord. Illustrations might be drawn from the example set by many noble and wealthy proprietors: in the first instance I will cite a case which shows how, with comparatively limited means, much good may in this way be effected. Mr. Dixon's recently published Memoir of John Howard records, that "when he first went to reside at Cardington, in Bedfordshire, about 1756, he found it one of the most miserable villages which could have been pointed out on the map of England. Its peasant inhabitants were wretchedly poor, ignorant, vicious, turbulent, dirty. * * * With his characteristic energy and earnestness, Howard set himself, within the sphere of his own competence and influence, to ameliorate their condition both in a worldly and spiritual sense. Beginning with his own estate, he saw that the huts in which his tenantry, like all others of their class, were huddled together, were dirty, ill built, ill drained, imperfectly lighted and watered, and altogether so badly conditioned and unhealthy, as to be totally unfit for the residence of human beings. He resolved to begin his work at the true starting point, by first aiming to improve their physical condition—to supply them with the means of comfort, attaching them thus to their own fireside, the great centre of all pure feeling and sound morals—to foster and develop in them a relish for simple domestic enjoyments."

"His first step, in furtherance of these objects, was obviously a wise one, that of rendering the *homes* of the poor, dwellings fit for self-respecting men.

This must indeed be the starting point of every true social and industrial reformation. In carrying his plan into effect, Howard does not seem to have troubled himself much about that paramount question, the per-centage. Though an arithmetician and a man of business, he considered that his wealth was merely held in trust for the benefit of mankind, and consequently he had no hesitation in investing it with a view to returns rather in the shape of order, virtue, intelligence, and happiness, than in money."

"Having decided that the miserable mud huts in which he found his cottagers living should be taken down, he carefully selected some good and convenient plots of ground, on which he caused a number of very superior cottages to be built, and transferred into them such persons as he most strongly approved of for tenants. His absolute requirements were—habits of industry, temperance, and observance of the Sabbath. The doctrinal opinions of his tenants he did not interfere with."

In now directing your attention to the very important communication on the dwellings for agricultural labourers made by his Grace the Duke of Bedford through the Royal Agricultural Society, in a letter addressed to the Earl of Chichester,* President of that Society for the past year, I feel assured that it will not be deemed unsuitable for me to quote such high authority on the obligations of landed proprietors.

"Cottage building," writes his Grace, "except to a cottage speculator, who exacts immoderate rents for scanty and defective habitations, is, we all know, a bad investment of money; but this is not the light in which such a subject should be viewed by landlords, from whom it is surely not too much to expect, that while they are building and improving farm-houses, homesteads, and cattle sheds, they will also build and improve dwellings for their labourers, in sufficient number to meet the improved and improving cultivation of the land.

"To improve the dwellings of the labouring class, and afford them the means of greater cleanliness, health, and comfort in their own homes; to extend education, and thus raise the social and moral habits of those most valuable members of the community, are among the first duties, and ought to be among the truest pleasures, of every landlord. While he thus cares for those whom Providence has committed to his charge, he will teach them that reliance on the exertion of the faculties with which they are endowed, is the surest way to their own independence and the well-being of their families.

"I shall not dwell, as I might, on the undeniable advantages of making the rural population contented with their condition, and of promoting that mutual good-will between the landed proprietor and the tenants and labourers on his estate, which sound policy and the higher motives of humanity alike recommend."

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* The attractive appearance of the cottages on the Sussex estate of the Earl of Chichester will be recollected with pleasure by many, not only as conducing to the picturesque beauty of Stanmer Park, but also as evincing a kind consideration for the comfort of their occupants.

Such are the admirable principles laid down by his Grace. Their practical echo from the halls and the mansions of our nobility and landed gentry would speedily effect the much needed change.

I have lately had the pleasure of examining a considerable number of the new cottages recently built, with judgment and great care,* on the Duke's Bedfordshire property, which already exceed 100; and it is the intention of his Grace gradually to continue the rebuilding of decayed tenements in the same county, until 300 more are erected. The building establishment at Woburn Abbey is on a princely scale, comprising extensive machinery, worked by a steam-engine of twenty-five horse power, and providing employment for 200 workmen. In Devonshire the Duke is carrying out the same spirit of improvement, to the extent of sixty-four cottages.

The example thus nobly set by the Duke of Bedford has been speedily followed by his Grace the Duke of Northumberland. Many other great proprietors have also undertaken the same good work, which, if it do not return a full per-centage on the outlay, cannot fail to be *repaid* by those feelings of increased contentment and good will which are the best bonds between a landowner and the peasantry on his estate.

The designing of improved dwellings for agricultural labourers, arranged on the most economical plan, with proper regard to the health and comfort of the occupants, has been repeatedly made a subject for architectural competition. In most instances the result would have been altogether unsatisfactory, but for the communications elicited from landed proprietors whose attention had been practically directed to the subject; such, for instance, are the plans of the Marquis of Breadalbane's cottages, published in the volumes for 1843, 1845, of the Transactions of the Highland and Agricultural Society of Scotland; and the plans of the Duke of Bedford's cottages, published in the Journal of the Royal Agricultural Society, for July, 1849.

The same number of this Journal contains the competition design to which the first premium of fifty sovereigns was awarded by that Society, in the spring of 1849. In reference to this design, a recent talented and discriminating writer† on labourers' cottages remarks, "I can only say, that I hope no one of its many influential members may be led—by the sanction of the Society—to build after this model."

To facilitate the adoption of plans which combine in their arrangement every point essential to the health, comfort, and moral habits of the labourer and his family, with that due regard to stability and economy of construction, which is essential to their general usefulness, the Society for Improving the Condition of the Labouring Classes published, and

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* An interesting account of these cottages is given in a pamphlet lately published by the Rev. C. H. Hartshorne, entitled "The System of Building Labourers' Cottages pursued on the estate of his Grace the Duke of Bedford."

† The Rev. T. James, of Theddingworth, Northampton.

have circulated extensively, a series of designs for Cottages,* prepared with these special objects in view.

These plans have lately been revised, and are now republished, with the addition of others designed on the same general principles, but with such variations as will afford not only a greater choice in the number and disposition of the apartments, but also in the external elevation; so that where many cottages are built near to each other, a considerable variety may be obtained by a judicious selection and grouping. It must be obvious, however, that owing to the difference of material used in various parts of the country, no set of designs could be arranged so as to be suitable to all circumstances; hence it has been deemed advisable to adapt the arrangement of these designs to the material in which they will probably be most frequently built. Although, for this reason, brick has been selected, the designs may, with some alterations in the thickness of the walls, be executed equally well in stone, or in flint, with quoins and dressings of brick or stone.

On the ground of economy, as well as for other reasons which it is unnecessary to detail, the dwellings generally are designed in pairs, care being taken to prevent, as far as possible, the interference of adjoining families with each other, by placing the entrance doors at the opposite extremities of the cottages, whilst, by carrying up the chimney-stack in the centre, the greatest possible amount of warmth is obtained from the flues.

Each dwelling consists of a living-room, the general superficial dimensions of which are about 150ft. clear of the chimney projection. A scullery, containing not less than about 60ft. or 70ft. superficial, which is of sufficient size for ordinary domestic purposes, without offering the temptation to its use as a living-room for the family; besides a copper, and in some cases a brick oven, provision is made for a fire-place in all the sculleries, by which arrangement the necessity for a fire in the living-room through the summer is avoided. A pantry for food, a closet in the living-room, and a fuel store out of the scullery, are provided in all the cottages.

The sleeping apartments, in conformity with the principle of separating the sexes, so essential to morality and decency, are generally three in number, each having its distinct access; their dimensions somewhat vary—the parents' bed-room in no instance contains less than about 100ft. superficial, whilst the smaller rooms for the children average from 70ft. to 80ft. superficial. The height from the ground floor to the first floor is 8ft. 9in., giving nearly 8ft. clear height for the living-room. The bed-rooms are 7ft. 9in. where ceiled to the collar pieces, and 4ft. to the top of the wall-plate, which, for the security of the roof, is in no case severed by the dormer windows.

Although these designs generally provide three bed-rooms, yet, as in

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* Terms and agreements for letting cottages are given at p. 38.

some cases, without any infringement of decorum, a less number of sleeping apartments would be better suited to the wants and circumstances of the occupants, and the temptation to take in lodgers be avoided, three of the designs are arranged with a smaller number of bed-rooms.

Where circumstances render it desirable that the occupants of cottages should be allowed to take in a lodger, the chief evil to be deprecated may, in some measure, be guarded against, by separating his sleeping apartment entirely from those of the family; with this view the Design No. 7 has been arranged with a bed-room on the ground floor, available either for a lodger or for the boys of the family, whilst the first floor is exclusively appropriated to a bed-room for the parents and one for the girls. The rustic porch to this design formed with rough timber, would be ornamental, and, at the same time, inexpensive; it might be applied equally well to some of the other designs, or may be omitted at pleasure.

The several designs may be thus briefly described (see Lithographic Drawings in Appendix):*—

No. 1. Double Cottages with one bed-room.
No. 2. Ditto, with two bed-rooms.
Nos. 3, 4, 5, 6. Double Cottages, each with three bed-rooms; varying in internal arrangement and external elevation. The cost of the three latter of these cottages would progress in the same relation to each other as their numbers, but not in like proportion.
No. 7. Double Cottages, with three bed-rooms; two on the upper and one on the ground floor, suited for a lodger or for the boys of the family.
No. 8. Double Cottages† for four families, with two sleeping apartments to each; two of these tenements are on the ground floor, and two above, with separate entrances, and distinct domestic conveniences. Hollow brick or tile arches tied with iron rods might advantageously be used for the intermediate floors of these cottages.
No. 9. Two Single Cottages, with three bed-rooms, suitable for Gate Lodges; more ornamental and expensive in design than any which have preceded them.
No. 10. A Lodging House for 14 or 16 unmarried workmen or labourers; adapted to Agricultural, Mining, and Quarry Districts, with apartments for a married superintendent.
No. 11. Elevation of Design No. 5; showing a variation in the gable and dormer coping, with flint wall facing, brick dressings, and quoins.

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* Engravings of these designs are given in the Appendix, and working drawings, with a specification and bill of quantities of most of them, are published by the Society, and may be obtained of the Secretary, Mr. Wood, at 21, Exeter Hall.

† Double cottages for four families, with *three* sleeping-rooms to each tenement, may be arranged with an open staircase between them, similar to the plan described at p. 7, of which H.R.H. Prince Albert's Exhibition Model Houses is an example; see the Appendix, page 58, and the Windsor Royal Society's Cottages, page 61.

These alterations are equally applicable to any of the preceding designs. This plate also contains three Plans with two elevations for such out-buildings as are considered indispensable in some counties. One plan is with, the other two without, a piggery. Where the closets are in detached out-buildings, the space allotted for them in the main building will be useful for agricultural implements, &c.

No. 12. Exhibits various suggestions for the picturesque grouping of Double Cottages according to the preceding designs.

The Lodging-house for unmarried Workmen or Labourers is intended to provide a comfortable, cheap, and healthy abode, free from the temptations to vice and immorality which beset the inmates of a crowded cottage, where, without regard to age or sex, the married and the unmarried too often herd together and contaminate each other. The youth who quits the parental cottage, from its want of accommodation for a growing family, or from the desire of independence, would find in such a house those comforts which the unmarried labourer rarely enjoys, and to attain which he too frequently forms an improvident connexion. Instead of passing his evenings at the beer shop, he would be led to seek both amusement and instruction in the pages of a selected Library, placed under the care of the superintendent; or his leisure hours might be profitably employed in an allotment garden, if an acre to an acre and a half of ground could be thus devoted.

The number of lodgers which the proposed plan will accommodate may be either fourteen or sixteen, as two of the compartments will contain two beds; under ordinary circumstances, it would be preferable to build a second house rather than to increase its size to any considerable extent.

The arrangement provides on the ground floor two sets of apartments, one intended for the superintendent and his wife; the other, for the lodgers, comprises a living room, fitted up with tables and benches, a kitchen, with a pantry having a separate, secure, and well-ventilated safe for the food of each inmate; a fuel store, with depository for implements or tools, would be at the back.

The whole of the upper floor is occupied by the dormitory, which is sub-divided by wooden partitions, six feet six inches high, into fourteen compartments, each 8ft. 6in. by 4ft. 8in., having its own window, with a door opening from the central corridor, and being fitted up with a bed, a flap-table under the window, a stool, and a locker or clothes-box. The ventilation of the upper part of the dormitory is effected by openings over the windows in the gable walls.

The rent charged must in some measure depend on local circumstances; but it is scarcely to be expected that such accommodation can be provided for less than 2*d.* per day, or 14*d.* per week; in some places 18*d.* or even 2*s.* would not be too high a charge. Punctual payment must be strictly en-

forced; and the occupation should be by the week, subject to such rules* as may ensure the order and comfort of the inmates.

The cost of Cottages, built in a substantial manner, in the country or in the neighbourhood of London, must depend so much on the price of materials, as well as the expense of labour and cartage, that no amount can be stated which would guide with accuracy under such varying circumstances. Information of the actual cost of cottages built after the Society's plans is received with thankfulness, and may be of service to other cottage builders.

Some practical suggestions on the most important points connected with Cottage building may be a useful termination to the preceding remarks.

In reference to situation, where it is practicable the front should have somewhat of a southern aspect; the embosoming in trees should be avoided, and particular attention ought to be paid to secure a dry foundation; where this is not otherwise obtainable, artificial means should be adopted by forming a substratum of concrete, about twelve inches thick, or by bedding slate in cement, or laying asphalte through the whole thickness of the wall under the floor level. The vicinity of good water and proper drainage are points of obvious importance. A gravelly soil is always preferable to clay, and a low situation is seldom healthy.

It is desirable that every cottage should stand in its own enclosed garden of not less than about one-eighth of an acre, and have a separate entrance from the public road. One well may generally be made to answer for two or more cottages, and it is of great importance that it be so placed as not to be liable to contamination either from the drains, cesspools, or liquid manure tank; the latter should, however, invariably be made water-tight, the cost of which will soon be repaid to the tenant by its fertilizing products.

As respects the material used in the external walls of cottages, much must depend on local circumstances, and the facility for obtaining the various kinds of natural or artificial substances adapted to the purpose.

The designs published by the Society have, for the reasons previously stated, been wholly arranged for brick, but by increasing the thickness of the external walls they will be equally well adapted for cottages built with other materials. The external walls are described as 9in. thick, and when built of this substance, in order to secure their dryness,† unless the bricks

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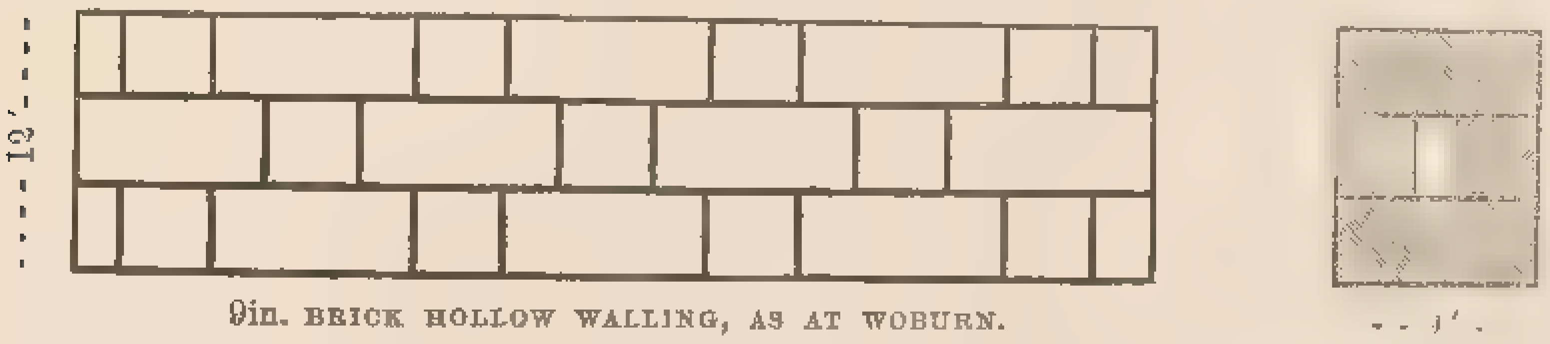
* Rules for the guidance of the superintendent, as well as for the lodgers, are given at pp. 36 and 37.

† The following description of a process which has been successfully applied for rendering brick and porous stone impervious to wet, may be useful:—" Dissolve mottled soap in water, in the proportion of three-quarters of a pound to a gallon of water, and to the surface apply with a large brush this mixture, which, in order to its liquid state being retained, must be kept heated. At the expiration of twenty-four hours the application of this wash is to be followed by a second, composed of half-a-pound of alum thoroughly dissolved in four gallons of water. In order to avoid the disturbance of the soap deposit, this solution is best applied with a syringe or common water-can, having

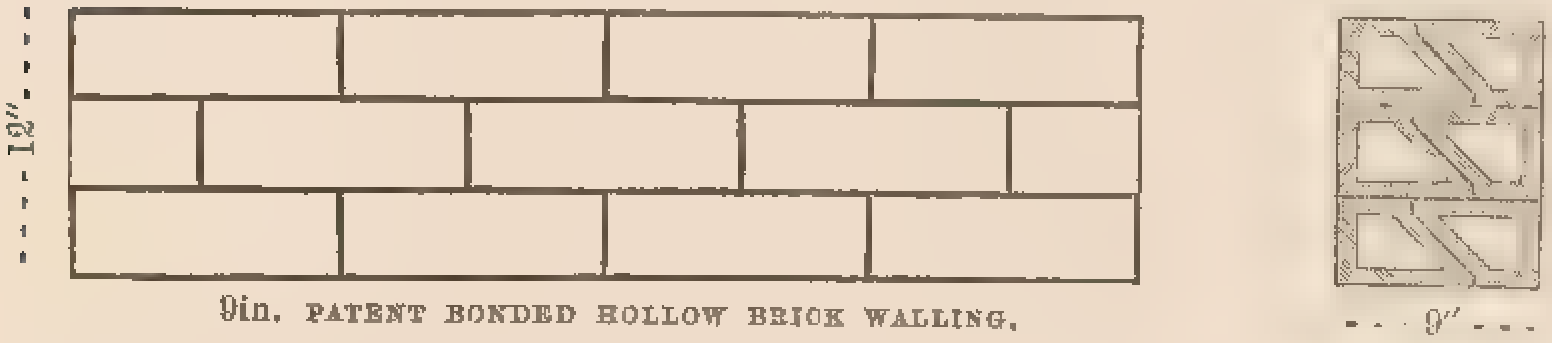
are unusually impervious to moisture, it is strongly recommended that they should be hollow; this may be effected by three methods, two of which require that the bricks be made on purpose. The plan No. 1 has been used to some extent; and unless where the bricks are so porous as to cause a transmission of moisture through the heading courses, this plan will be found to answer, rendering the walls drier and cheaper than when built in the ordinary way. Three courses, with the joints, rise 1ft., the bricks being 3½ square; they are of the ordinary length—viz., 9in.

No. 1.



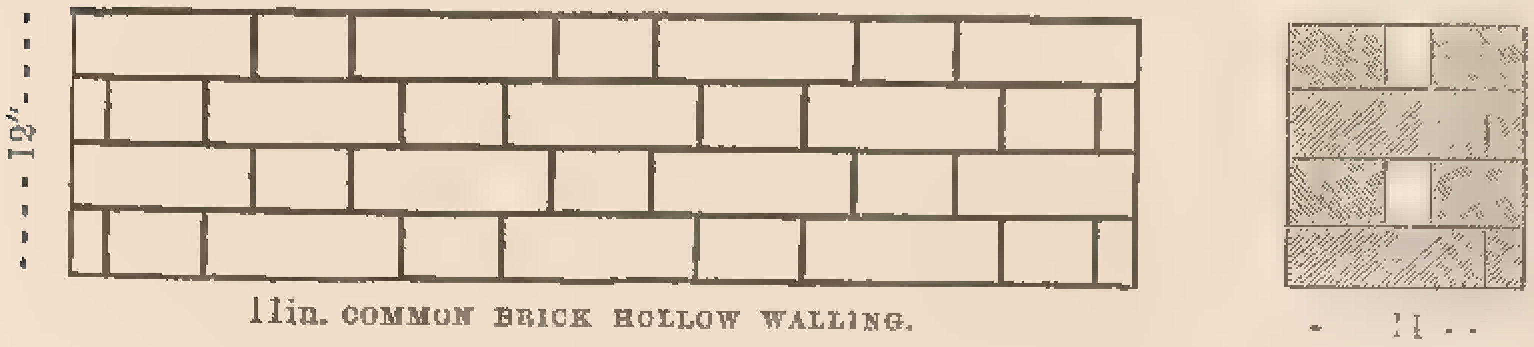
9in. BRICK HOLLOW WALLING, AS AT WOBURN.

No. 2.

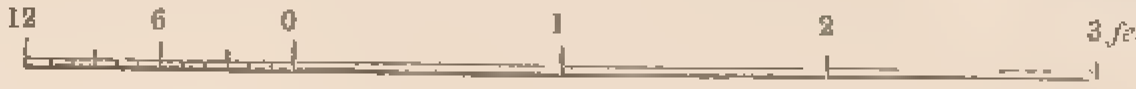


9in. PATENT BONDED HOLLOW BRICK WALLING.

No. 3.



11in. COMMON BRICK HOLLOW WALLING.



The other plan, No. 2, is that of hollow bricks made wedge-shaped, and bonded longitudinally over each other, so that two cavities run parallel through every course of bricks, giving a double security against moisture, as the joints are all broken, and there are no headers to pass through the wall; the rise of these bricks is also three courses to the foot, and they are 12in. long, which diminishes the number of joints, and gives greater boldness to the work, more resembling stone in effect. These bricks are patented;* they may be easily made with any tile machine at the same or at a small cost per thousand above that of sound common stocks; whilst from their

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a finely perforated hose. The alum uniting with the fat, produces an insoluble compound, which, entering into and adhering to the absorbing surface of the material, a composition of alumen soap is formed, which has the property of repelling water.

* The author, who is the inventor and patentee of these hollow bricks, will grant licences, free of royalty, to those who may wish to make them for building cottages on their own estates. Applications for this purpose should be addressed to him at No. 21, Exeter Hall.

increased size, which adds but little to their weight, nine of them will be found to do the same number of cube feet of walling as sixteen ordinary stocks. The saving in mortar is full 25 per cent., and the labour, to an accustomed workman, considerably less than to ordinary brickwork; whilst great facility is afforded by the cavities both for ventilation and warming. It should be added, that the bricks for the quoins and jambs may be either solid or perforated perpendicularly.

Where it is impracticable to obtain bricks made according to either of the forms above described, the walls may be built hollow, 11in. wide, with common bricks (see Plan No. 3); a cavity of 2in. being left in the centre, and the length of the headers made up with 2-inch closures, every course would bond, and a dry wall be secured.

Where flint or concrete is used, the walls cannot be less than 12in. thick with either material; they may be lined * with the patent hollow brick, which would bond every course, and contribute to the dryness of the wall.

Concrete walls are composed of gravel, lime, and sand, and they are worked up between two planks on a frame, within which the concrete is poured; they may be "splashed" over outside, which gives them a neat appearance. Concrete formed with clean coarse gravel, sharp sand, and $\frac{1}{10}$th portion of Portland cement, would make a substantial wall.

Chalk has been used for the walls of cottages in some districts with satisfaction, and when hardened by immersion in silicate of potash, its value as a building material is increased. The artificial stone recently introduced by Mr. Ransome, is a chemical combination of materials, which, when brought to maturity, may be available for the construction of cottages and their appendages.†

Where the walls are of stone, their dimensions must be increased externally to not less than eighteen inches, and in such case six inches should be added to the height of the roof, to preserve its proportions.

The main partitions on the ground floor should be of brick—hollow bricks where obtainable, may with advantage and economy be used for this purpose; in either case, they are stronger when set in Roman or Portland cement. Where the upper floor partitions stand perpendicular over those to the ground floor, brick or tile is decidedly preferable to wood. Partitions formed with hollow bricks may in many cases be carried on a strong binding

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* The lining of rubble stone walls with tile was common in Roman buildings; the Colosseum may be instanced as an example, where much of the inner wall is constructed of rubble, and faced with tile, which has been covered with slabs of different coloured marble. Behind these tiles are inducts containing circular earthenware pipes for conveying the water from the top of the building. At Pompeii, a hollow tile was in some instances used for securing a dry surface to receive the fresco paintings.

† No particular reference is made to Pisé, mud or cob walls. In some counties they are said to answer. The Author has seen them used much in Devonshire, but cannot recommend their general adoption.

joist. Stairs may also be made of fire-brick clay, with great advantage and economy.

The ground floor should be raised not less than six inches above the external surface, and where wood floors are used they ought to be ventilated by means of air-bricks built in the external walls. The warmest and most economical floor is probably that formed with hollow bricks.* In some parts of the country lime and sand-floors are pretty generally used, and found to last, when well made, upwards of forty years. The following description of the mode of working them may be useful:—A foundation or substratum should be prepared, about six inches thick, with coarse gravel or brick-bats and lime-core, well beaten to a level surface; in damp situations, tar may be added to this concrete, on which is to be laid the lime and ash floor, thus prepared—take good washed sand, free from all earth and small stones, together with the ashes of lime, fresh from the kiln, in the proportions of two-thirds of sand and one-third of lime ashes, (where obtainable, the substitution of one-third portion of smith's-ashes, or pounded coke, for one half of the sand, increases the durability and hardness of the floor.) Mix the sand and lime ashes well together, and let them remain in a body for a fortnight, in order that the lime may be thoroughly slaked; then temper the mortar, and form the floor with it three inches thick, well floated, and so worked that it be not trodden on until it has laid for three days, when it should be well rammed for several successive days, until it becomes hard, taking care to keep the surface level; then use a little water, and smooth it with a trowel; after this, keep the floor free of dirt, and when perfectly dry, it may be rubbed over twice with linseed oil, which gives the appearance of stone instead of sand. The price paid for such floors is about 6*d.* per yard for labour, and 8*d.* per yard for materials.

Tiles† will generally be found a preferable covering for the roofs to slate, being warmer in the winter and cooler in summer; and requiring much less lead, are more economical. In some localities, however, slate may more effectually exclude the weather.

With a view to provide for efficient ventilation, an air-flue, 9in. by 4½in., should be carried up in one of the jambs of the ground-floor chimney, commencing under the floor-level, and passing into the flue from the bed-room

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* Vide Appendix, p. 32, for a description of the form and dimensions of hollow bricks adapted for this purpose, and for additional information on the use of hollow bricks and tiles. At the reading of this Essay, Capt. Buller, R.N., mentioned that he had, in Devonshire, some years since, built with hollow bricks, at the cost of 100*l.*, a pair of cottages, each containing two rooms and a kitchen, 13 feet square, all on the ground floor. The walls, which were six inches thick, in consequence of the bricks being used singly, had not been perfectly tight at the joints, although otherwise very dry; this inconvenience is effectually remedied by the double course of bonded hollow bricks, described at p. 25.

† Blue metallic tiles, and ridge rolls of Staffordshire manufacture, are amongst the most durable materials for roofs.

chimney, an opening being formed into it immediately under the ceiling of the living-room, filled in with a plate of perforated zinc. The bed-room over the living-room may be aired and warmed by a pipe, 2½ inches diameter, passing through this flue from the side of the fire-place on the ground floor, and opening into the bed-room above. The lower part of the flue may be made to serve as an air-feeder to the fire-place of the living-room. The bed-rooms without a fire-place should have an aperture in the partition over the door, filled in with a perforated zinc ventilator, or an air-pipe may be carried through the roof, and bent over at the top.

The windows should have chamfered and rebated wood frames, with oak sills set on a stone or moulded brick projecting sill; they should have zinc quarry casements, hung to open outside, with proper stay-bar fastenings; the shutters of the ground-floor windows may be conveniently arranged to answer the purpose of a table, by hingeing them so as to fall under the window.

The plastering to the walls of the living-room in cottages has in some cases been omitted, but with very little saving of expense, as the brickwork requires additional care; and there is certainly a diminished appearance of comfort. If a chair-rail be fixed, the wall under it rendered with cement and above plastered with sharp sand and good lime, the annual cost of repair will be but trifling. Plastering to the walls of any other part of the ground floor, excepting the living-room and perhaps the porch, is undesirable. Much benefit would result from a general adoption of the plan pursued by the Duke of Bedford, of having all his cottages whitewashed once a-year, the cost being charged to the tenant at a fixed sum.

In lieu of receiving rain water from the roofs in wooden butts, it is a greatly preferable plan to form between a pair of cottages an oval tank about 7ft. by 4ft. diameter, and 3ft. 6in. deep, divided into two compartments, with an oak flap to cover each side. The water from the gutter piping should be led into it by earthenware pipes 4in. diameter. Soil drains of any length should not be less than 6in. diameter.

In cases where the closets are constructed under the roof of the dwelling-house, though entered from the outside, it is important that pans should be used for conveying the soil to a cesspool or liquid manure tank formed without the building. These are most efficacious when supplied with water, as they may be at a little extra expense from the lift-pump in the scullery, which can readily be made to fill a small cistern or reservoir fixed a little above the seat. These may be of cast-iron, built in the wall, or of earthenware.

The following plan has proved effectual in situations where it was otherwise difficult to blind or conceal the closets, when erected as an out-building: the appearance of a pile or stack of fuel-wood is given by a casing of split or half-round larch timber laid horizontally, and having short pieces of whole timber at the angle spiked to the ends of each alternate layer; the interior framing may be bricknogged, and the roof of slab slate, or strong

zinc. These and other outbuildings might with advantage be constructed with common hollow bricks 5in. or 6in. wide, which, put together with cement, would also form an economical covering.

The use of hollow bricks for enclosure or division walls would secure greater durability, and in many cases be but little more expensive than wooden fencing.

In closing these remarks on the Dwellings of the Labouring Classes, I cannot but add that it will be to me a source of permanent satisfaction if they should prove of any service to the members of the Institute, or conduce in any way to the removal of obstacles which present so formidable a barrier to the social and religious advancement of a very numerous and deserving class of the community.

To contribute to the welfare of our fellow-creatures, with a view to the glory of God, carries with it that durable happiness which the pursuit of wealth, of fame, or of fleeting pleasure, cannot afford.

APPENDIX.

EXPENDITURE ON, AND REVENUE FROM MODEL HOUSES.

THE following statement of the cost of land—expense of construction—amount of rents received, and annual expenditure connected with the several buildings belonging to the Society for Improving the Condition of the Labouring Classes, will be interesting to those who contemplate similar undertakings:—

1. Model Buildings, Bagnigge Wells, for 23 families and 30 single females, commenced in 1844. Cost of land, 1045*l.*; outlay on the buildings, 5325*l.*; average rents per annum, 391*l.*; taxes and current expenses, exclusive of repairs, 83*l.* per annum, leaving a return of about 4.33 per cent. on the cost of the buildings, and of 4 per cent. on the cost of the land.

2. George Street Model Lodging House for 104 single men, commenced in 1846. Cost of land, 1200*l.*; outlay on the buildings, 4289*l.*; outlay on the furniture, 936*l.*; average receipts from the lodgers, 614*l.* per annum. Taxes and current expenses, exclusive of repairs, are 308*l.* per annum, leaving a return of about 5 per cent. on the cost of the building and furniture, and of 4 per cent. on the cost of the land.

3. Streatham Street Model Houses for 54 families, commenced in 1849. The land is rented at 50*l.* per annum. The outlay on the buildings has been 8860*l.* The rents since the addition of six tenements to the forty-eight originally provided, are at the rate of 745*l.* per annum. The ground-rent, taxes, and current expenses, exclusive of repairs, are 235*l.* per annum, leaving a return of 5.75 per cent. on the amount of outlay.

4. Thanksgiving Model Buildings, Portpool Lane, Gray's Inn Lane, for 20 families, 128 single women, and a public wash house, commenced in 1850. Cost of the land, 1700*l.*; outlay on the buildings, 9500*l.* The amount of revenue derivable from the whole cannot yet be stated, owing to the length of time required for bringing into full operation the washing establishment, for which there is reason to believe increased accommodation will be required. The house for single women has filled more slowly than the family houses, which found immediate occupants at fair remunerative rents.

5. Charles Street Lodging House, for 84 single men. Amount of outlay on repairs, adapting and furnishing, 1163*l.*; average receipts from the lodgers, 415*l.* per annum. Rent, taxes, and current expenses, exclusive of repairs, amount to 222*l.* per annum, which leaves a clear return of 17 per cent. on the amount of outlay.

6. Hatton Garden Lodging House, for 57 single women. Amount of outlay on repairs, adapting and furnishing, 1045*l.* This house has been let as a depôt for female emigrants at a fixed rent, returning 7½ per cent. on the outlay.

The total expenditure on the six buildings above described, with the furniture of the lodging-houses, is 31,118*l.*, and on the land or site of three of the buildings, is 3945*l.*; the net return, exclusive of repairs, from those fully occupied, being at the rate of about 6 per cent. on the buildings and furniture, and of 4 per cent. on the land.

In reference to the outlay on repairs, the experience of the Society shows that, taking new and old buildings together, and including the furniture, an average expenditure of ¾ per cent. per annum is sufficient.

It should be observed that the revenue as shown above, might be easily augmented by raising some of the rents to the full value of the property; this applies particularly to the Model Buildings, Bagnigge Wells, the cost of which it has been already noticed was increased by peculiar circumstances. Moreover, the experience gained in the arrangement and construction of these houses, as well as the removal of duties on building materials since their construction, ought to facilitate the erection of similar buildings at a diminished cost.

ON THE FORM AND USE OF HOLLOW BRICKS.

The importance of hollow bricks in the construction of dwellings for the labouring classes, warrants some further remarks on this subject. No one conversant with houses of slight construction can be unaware of the evil to which they are so liable from damp external walls and floors; any remedy which contributes to its removal, without adding to the cost of the building, must therefore prove a great benefit to the occupants of such dwellings; and where a mode of construction effects this object at a diminished cost, it is a boon to the landlord as well as to the tenant.

The use, in architectural construction, of hollow-shaped clay, in a variety of forms, was known to the ancients, and amongst other purposes was adopted by them in lightening the weight of the spandrils to vaulting of considerable span.

For the lining of rubble-stone walls tile was commonly used in Roman buildings. The Colosseum may be instanced as an example, where much of the inner wall is constructed of rubble and faced with tile, which has been covered with slabs of different coloured marble. At Pompeii, a hollow tile was in some instances used for securing a dry surface to receive the fresco paintings.

In the *Illustrated London News* of October 5, 1850, drawings are given of Roman flue-tiles, found at Lymne, in Kent, where they have been used for distributing warm air from an hypocaustum under the floor of the building.

Hollow bricks are peculiarly adapted for agricultural buildings, and for enclosure, park, or fence walls, as well as for the ordinary dwellings of the labouring classes, for schools, and for houses generally of moderate height, and with the usual weight of roofs and floors. For conservatories they may be used with singular advantage. Heat may be passed through every portion of both floors and walls. When used for partitions, or for roof and floor arches, they are fire-proof, deaden sound more effectually, and are considerably lighter than solid brickwork. As a lining to stone or flint walls, they supersede the necessity for battening, and the consequent risk of fire and dry rot is avoided. For cottage floors they are also well adapted.

The strength of hollow bricks may be adapted to circumstances, and where required, be rendered fully equal to that of solid bricks.

By the form adopted in the patent hollow brickwork, a perfect bond, running longitudinally through the centre of the wall, is secured, all headers and vertical joints passing through it are avoided; internal as well as external strength is obtained; and every facility given for the fixing of floor-plates, and other timbers; whilst great facility is afforded for ventilation, as well as for the conveyance of artificial heat, and for the transmission of bell-wires, pipes, &c.

According to the specification enrolled 15 June, 1850, this patent includes bricks and tiles, hollow or otherwise, of such form as will secure a "longitudinal bond, whether obtained by the overlapping of the alternate or the parallel courses of bricks, either with a square, a rebated, or a chamfered joint, and with a level, a sunk, or a bevelled bed."

The dimensions of the bricks being unlimited, a size has been chosen for general use which, with the omission of the headers, reduces, by about one-third, the number of joints, and greatly improves the appearance of the work, giving it more boldness of effect and resemblance to stone than that of ordinary brickwork—twelve inches in length, including the joints, three courses rise one foot in height; a size equally convenient for the workmen in the manufacture, and in the use of the bricks—whilst less liable to damage in moving than bricks of larger size, their form admits of ready handling and stowage for transport.

The principle of the patent bond is, however, equally applicable to the ordinary three inch, or to any other size of brick, as is shown by the annexed example of hollow brickwork in six inch courses.

Nine patent hollow bricks of the size before described will do as much walling as sixteen ordinary bricks, whilst the weight of the former but little exceeds that of the latter, an important consideration in reference to carriage, as well as labour in using.

When passing through the machine, or in the process of drying, any number may be splayed at the ends to the rake of gables, be mitred, or be marked for closures, and broken off as required in use; or they may be perforated for the purpose of ventilation. If nicked with a sharp-pointed hammer, they will break off at any desired line; and the angles may be taken off with a trowel as readily as those of a common brick. A sufficient portion of good facing bricks may be selected from an ordinary burning, and in laying them, a much better bond will be obtained than is usually given in common brickwork.

The splayed bricks may be used for the weathering of plinths, for eaves moulding under gutters, and for gable moulding under projecting tiles or slates, in lieu of barge boards. Labels for doors and windows may be made hollow in lengths.

The bricks for the quoins and jambs may be made either solid or perforated; and with perpendicular holes, either circular or square, those in the quoins may be arranged to serve for ventilating shafts. Stone is equally applicable for the quoins and jambs, and the appearance of the work may be thereby improved.

Hollow bricks may be made with any good tile machine, in the same manner as ordinary draining pipes, and at about the same cost in proportion to the quantity of clay contained in them. The material is finer; they are more compressed, require less drying, and with much less fuel are better burned than ordinary bricks, even when waste heat, or that in the upper part of the kiln, only is used, a fire skin being formed both within and without.

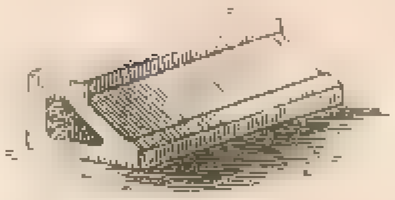
The process of drying is much more rapid than in common brickwork, and frost has much less effect on the joints. The smoothness of the internal surface of walls built with the patent bonded bricks renders plastering, in many instances, quite unnecessary, whereby a saving is effected, not only in the first cost, but also in the subsequent maintenance. If glazed on the outer face, as may be done with many clays, a superior finished surface is obtainable without plaster.

When made under favourable circumstances, the fair selling price of the patent bonded hollow bricks is about one-fourth more than that of ordinary bricks, at which rate, owing to the increase of size, a saving of nearly 30 per cent. will be effected; or if the selling price be one-third more than that of ordinary bricks, the saving effected by their use will be about 25 per cent., with a reduction of 25 per cent. in the quantity of mortar, and a similar saving in the labour, when done by *accustomed workmen;* the cost of carriage also will be considerably diminished.

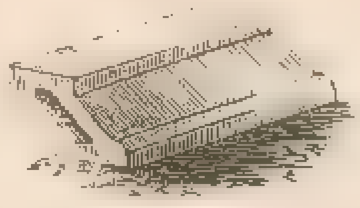
SECTION OF A 9in. DWARF WALL.

PATENT BONDED BRICKS.

No. 1

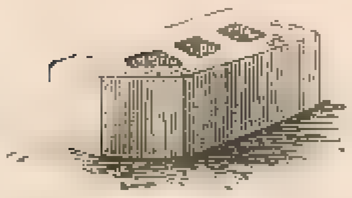


No. 2.



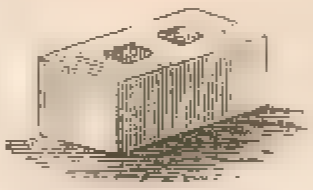
QUOIN BRICK.

No. 3.



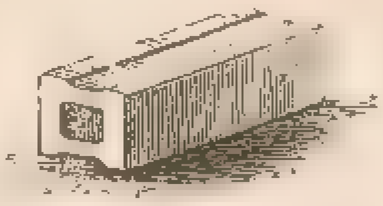
JAMB BRICK.

No. 4.

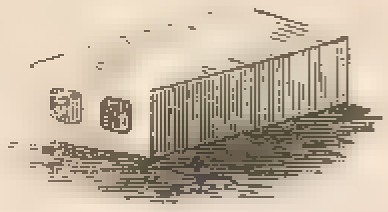


ARCH AND PARTITION BRICKS.

No. 5 & 6.

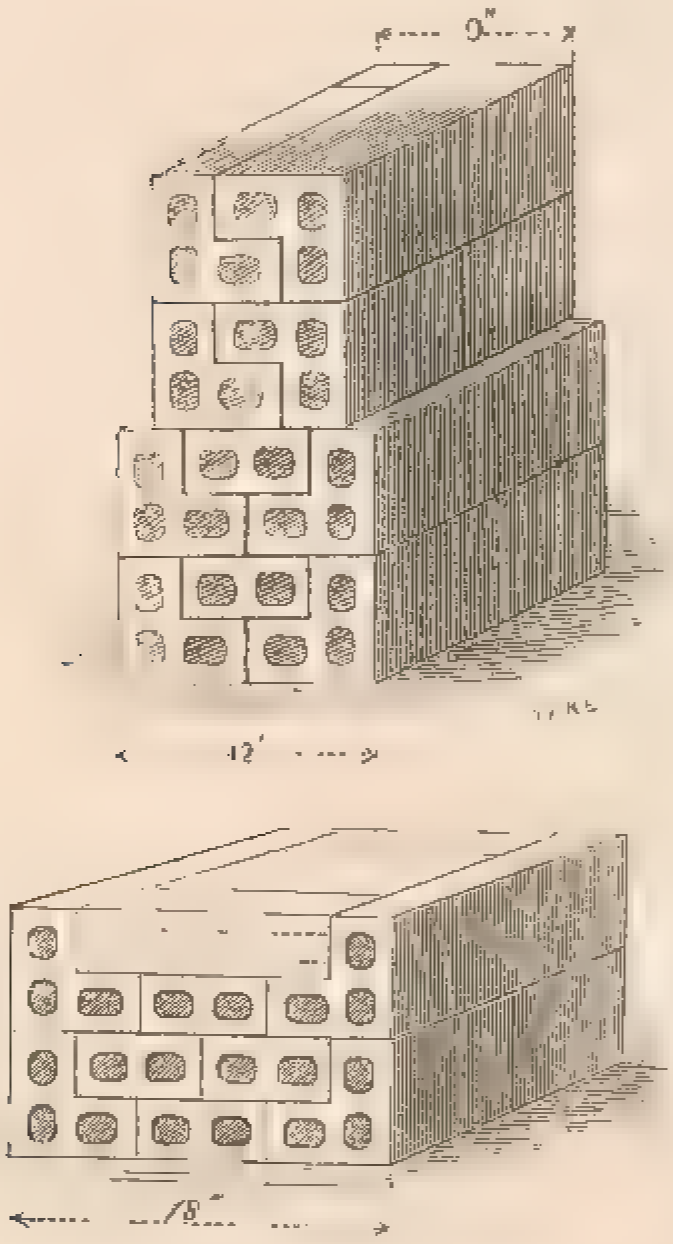


No. 7.



The bricks represented above are all 3¾ in. thick; but, if preferred, in order to work with common bricks, they may be made 2¾ in. thick. The dies will admit of more substance of clay being given where it is required to increase the strength of the bricks.

The quoins and jamb bricks may be made solid where it is more convenient.



Form and arrangement of Hollow Bricks adapted for walls where extra strength is required, or where the appearance of Stone is a recommendation.

Sections of walls built with Patent Bonded Hollow Bricks, having square rebated longitudinal joints, and rising in 6 inch courses externally.

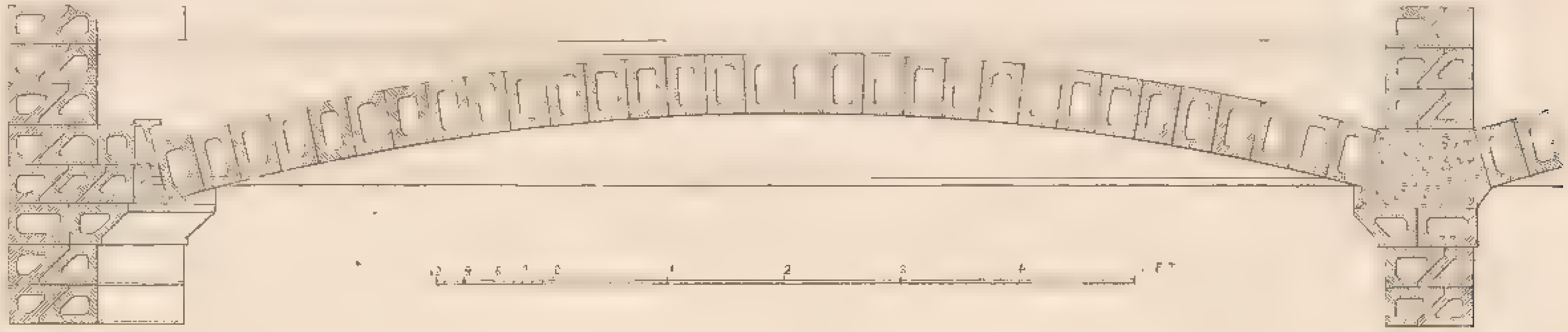
The form and dimensions of the bricks here shown will apply to walls 6, 9, 12, 18, 24, 30, and 36 inches thick. Above 12 inches thick the alternate inner courses may be laid either as headers or as stretchers, in the manner shown by the lower section, and where desired an internal course may be omitted for ventilation.

A filling-in of concrete may be substituted for the internal bricks. The external bricks will bond in with and form a good lining to flint or stone walls, they may be also used with common bricks.

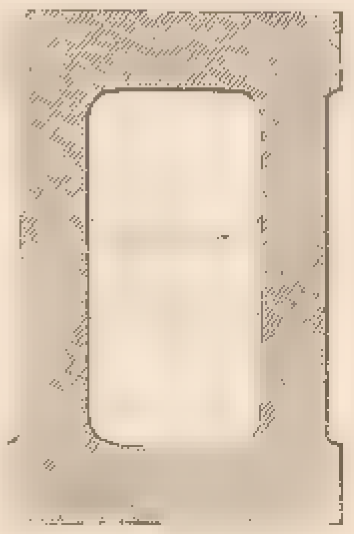
The internal bricks are suitable for partitions. The Quoin and Jamb bricks may be similar in form to those used with the Splayed Patent bricks, as shown above.

Experimental floor-arches, of 10ft. 3in. span, turned with hollow bricks 6 inches deep, between two cast-iron springers, similar in form to those shown in the drawing in the following page, and connected by ¾in. wrought-iron tie rods, 7ft. 6in. apart, were loaded with bricks equally distributed over the arch to the extent of 8 tons 13 cwt. 3 qrs., when they broke down through the crushing of the bricks; the deflection of the springer being ½in. In another arch of the same span, with the tie rods 9ft. 6in. apart, and loaded with 8 tons 10 cwt. 3 qrs., one of the springers broke; and, on examination, a flaw was found in the casting.

SECTION, SHOWING THE FLOOR AND ROOF ARCHES TO H.R.H. PRINCE ALBERT'S EXHIBITION MODEL HOUSES, AND THOSE TO THE MODEL HOUSES IN STREATHAM STREET AND PORTPOOL LANE.

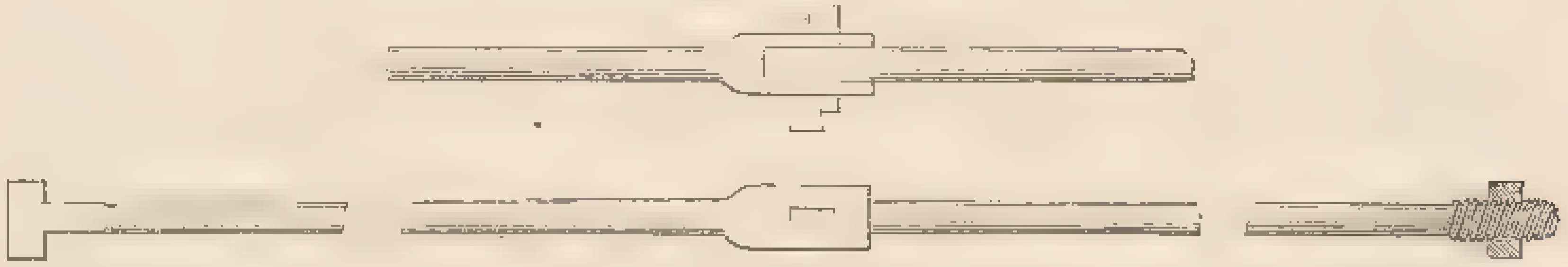


Section ($\frac{1}{4}$ full size) of a Hollow Brick adapted for Floor Arches, &c



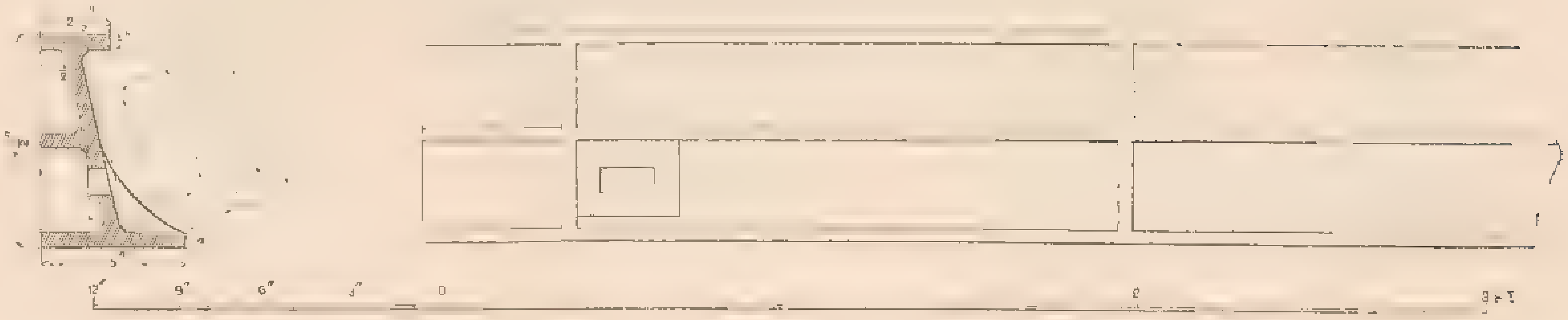
The central dotted lines show how increased strength may be given.

Wrought Iron Tie Rods to Arches, $\frac{3}{4}$-inch in Diameter.



Section of Springer.

Elevation of End of Cast Iron Springers.



ARTICLES OF IMPORTANCE IN THE CONSTRUCTION AND FITTING UP OF DWELLINGS FOR THE LABOURING CLASSES, WITH ADDRESSES.

The best form of Soil Drain is probably that shown in the margin, which may be cleansed without any other removal than that of the upper tile, to which additional strength would be given by making it convex.

The best form of Water Closet Pan and most economical arrangement of Water Supply brought under the notice of the Author, is that by W. Patten, of Old Fish Street, Doctors' Commons. Those by Mr. Beggs, of Southampton Street, Strand, are also worthy the notice of parties intending to build. The Pans and other Sanitary Vessels manufactured by Ridgway and Co., of Cauldon Place, Staffordshire Potteries, are of superior material.

Iron Pumps, arranged for supplying the reservoir of the water-closet described at page 28, as well as for common house use, may be obtained, at 35*s.* each, of B. Fowler, Whitefriars Street, Fleet Street, who also supplies iron pipes and sinks. The same description of pump, with 6 feet of iron pipe, may be obtained, at 35*s.* each, of W. Williams, brick machine and agricultural implement maker, Bedford.

Ventilators, Dust Valves, Cottage Furnishing Ironmongery, including Galvanized Iron Window Casements and Bars with suitable fastenings, &c., are supplied by Hart and Son, 53, Wych Street, Strand, at schedule prices.

The best Cottage Range brought under the notice of the Author is that manufactured by W. N. Nicholson, of Newark, to whom a prize was awarded by the Royal Agricultural Society of England, at the York meeting in 1848, for "the best and cheapest grate or stove for cottages, combining safety and economy of fuel, with effectual warmth and facility for cooking." The range, with oven and boiler, for a 3-feet 2-inch opening, is charged at 35*s.* without, and 41*s.* with a brass tap; other sizes in proportion. Bed-room stoves, with fire-brick backs, cast-iron chimney piece and shelf, are supplied by the same manufacturer, at 8*d.* to 9*d.* per inch in width. One, 24 inches wide, a good bed-room size, costs 16*s.* Neat bed-room stoves, with metal bottom grates and hobs, have been supplied to the Windsor Royal Society at the following prices—viz., for 14-inch openings, 3*s.* 6*d.* each, 20-inch, 5*s.*, and 27-inch, 7*s.* 6*d.*

For Lodging-houses, Iron Bedsteads are recommended in preference to wood; those with patent joints, sold at the Bordsley Iron Works, Birmingham, and at No. 12, Panton Square, Piccadilly, also Mr. Burton, No. 39, Oxford Street, London, are well made, and have the advantage of being easily taken to pieces; their price varies according to the value of iron; if on castors, and japanned dark green, 6 feet 4 inches long, and 2 feet 6 inches wide (the dimensions recommended), they have been sold at 15*s.* 6*d.* each, in quantities of not less than twelve; 4 feet 6 inches wide for the Superintendents, cost 23*s.* 6*d.* Between the mattrass and iron laths, a strong canvass bag, filled with cut straw, which may be easily changed, has been found to answer well.

The Traps recommended for sinks are those of Lowe and Co., Salford, and can be obtained through any ironmonger.

Metallic Lava is supplied by Orsi and Armani, of 6, Guildhall Chambers, Basinghall Street.

Seyssel Asphalte is supplied by the Asphalte Company, 15, Stangate, Lambeth.

Fire Clay Ovens, as manufactured at the Bovey Tracey Pottery, Devon, are found to be cheap and useful articles, and are strongly recommended for general adoption. One charged 10*s.* at the Works, is sufficiently large to bake with once heating five quarterns of bread. The cost of heating is not more than three halfpence each time. In the country, where firewood is cheap, it does not exceed one penny per time. The cost of setting varies, but may be stated at from 15*s.* to 25*s.* or 30*s.*

A. Marshall, 49, Broad Street, Bloomsbury, supplies 21oz. sheet as well as rough plate glass at moderate prices.

DUTIES OF THE SUPERINTENDENT

OF

THE LODGING-HOUSE

FOR

UNMARRIED WORKMEN AND LABOURERS,

AT

THE Superintendent, together with his Wife, are expected to set an example of sobriety, decorum, and exemplary conduct, abstaining from whatever might in any degree countenance in the Lodgers an infringement of the Rules for the general regulation of the House.

He must faithfully account for all monies received by him or his wife from the Lodgers, at such time, and in such manner, as is required by the owner of the House.

He is to keep a book, in which, besides a regular entry of the names, period of occupancy, and payments made by each Lodger, a Record shall be kept of any particular circumstance which may occur, either of the nature of complaint or otherwise.

The Superintendent is to occupy, free of rent, the apartments appropriated to him, and he will be allowed Fuel, Candles, Salt, Soap, and such other necessary articles as may be required for keeping the house in proper order.

He is to be responsible for all the Beds, Bedding, Furniture, and other effects in the House, and, as far as is in his power, to preserve them, as well as the building and fixtures, from injury.

He is, together with his wife, to keep the House, the Bedding, Furniture, &c., scrupulously clean, and, to the best of his ability, conduct the establishment according to the Rules laid down for its government; in addition to which, the following instructions are to be carefully observed:—

1. No Lodgers to be admitted who are filthy in their persons, or of known bad character.

2. Although it is a Rule of the House that each Lodger shall pay his rent in advance, yet, as from time to time it may occur that Lodgers of whom the Superintendent has reason to form a good opinion may, from want of employment or other causes, be unable to pay, he may give credit to such for two weeks, but no longer, and this indulgence is not to be extended to more than three at any one time; in every such case the arrear may be paid gradually, but with as little delay as possible.

3. As it respects the notice required from a Lodger before he leaves the House, although the Lodgers are weekly tenants, if, under peculiar and unforeseen circumstances, a tenant is obliged to leave the House suddenly, or if he has been a tenant for three months, any money paid by him in advance may be returned to him.

4. The due observance of the Rules to which every Lodger subjects himself on his admission is to be enforced by the Superintendent; and in the discharge of this somewhat difficult part of his duty, he is expected to combine firmness with kindness, and to abstain from all needless and vexatious interference with the Lodgers.

5. In the management of the establishment, strict regard to economy must be observed, so as to prevent all waste of the articles to be provided for the Lodgers, which will comprise Fuel, Candles, Salt, and Soap.

6. In reference to the Books placed under the care of the Superintendent, he is to keep a list of them, and to enter regularly the name of every Lodger to whom they are lent, and to see that they are returned in good order.

RULES

OF

THE LODGING-HOUSE

FOR

UNMARRIED WORKMEN AND LABOURERS,

AT

THE LODGERS are to be admitted by the Week, on payment of per week, in advance, and to be subject to the following Rules, which are intended for the general comfort of the Inmates, and the good order of the Establishment:—

1. The House to be open from Five in the morning till Ten o'clock at night, subject to alteration according to the season of the year and to the occupations of the lodgers.

2. The Lamp in the Bed-Room to be lighted from Nine o'clock in the evening to Half-past Ten o'clock, when it is to be extinguished.

3. As the occupancy is by the week, each Lodger must give the Superintendent at least two days' notice, before the end of the week, if it be his intention not to remain, otherwise it will be considered that his occupancy is continued.

4. Each Lodger will be provided with a box and locker, for the security of his property, the keys of which will be delivered to him on depositing the sum of One Shilling, to be returned on the re-delivery of the keys. All property belonging to the Lodgers must be considered as under their own care, and at their own risk.

5. Each Lodger will be provided with a tray, two plates, a basin, a jug, a cup and saucer, or a metal cup, a knife, fork, and two spoons, which are to be under his own care, and on leaving the House they are to be returned to the Superintendent in a sound state.

6. The property of the Establishment is to be treated with due care, and, in particular, no cutting or writing on the Tables, Forms, Chairs, or other articles, and no defacing of the Walls, will be permitted. Any damage done by a Tenant is to be made good at his expense, or any article entrusted to him for his use, which may be lost or broken, is to be reinstated at his expense.

7. No spirituous liquors to be brought into the House, or drunk there. No person to be admitted or allowed to remain in a state of intoxication. No one, excepting the Lodgers, to be admitted to the House, excepting with the permission of the Superintendent.

8. No card-playing, gambling, quarrelling, fighting, profane or abusive language, to be permitted; and it is expected that the Superintendent and his Wife be treated with respect: their duty in promoting the comfort of the Inmates will be to see that these Rules are strictly observed.

9. Habits of cleanliness are expected in the Lodgers, and any person guilty of filthy or dirty practices, or rendering himself offensive to the other inmates, will not be permitted to remain in the House. Smoking cannot be allowed in the Living-Room or Bed-Room, but in the Kitchen only.

10. A wilful breach of any of the above Rules will subject the party to immediate exclusion from the House; but any money paid by him in advance will be returned after deducting the rent then due, and the amount of any damage which he may have done to the property.

11. It is expected that every Lodger will so conduct himself on the Sabbath, as not to desecrate the day.

12. For the benefit of those who may wish to avail themselves of the opportunity, the *Holy Scriptures*, and other books of an interesting and instructive character, will be lent by the Superintendent, in the hope that the Lodgers in this House will be thereby induced to spend their leisure hours in a profitable manner, as intelligent and accountable beings.

TERMS AND AGREEMENTS FOR LETTING COTTAGES

Terms and Conditions of Letting the Cottages belonging to
situate in the Parish of and County of

1. The Rent to be paid punctually, as per Agreement.
2. All Rates and Taxes in respect of the House to be paid by the Landlord.
3. Either party may terminate the Tenancy at any time, by giving a week's notice for that purpose.
4. Only one Family will be permitted to reside in a Cottage, and the Tenant is not to underlet or take in a Lodger, or carry on any trade or business therein, or keep poultry or a pig, without leave first obtained in writing from the Landlord or his Agent.
5. The Windows are to be kept clean, and the Ground-Floor Chimneys are to be swept once in Six Months. No alteration—by fixing or removing shelves or other fixtures—is to be made, without permission of the Landlord or his Agent.
6. General outside repairs are to be done at the expense of the Landlord.
7. The Windows, Ovens, and Coppers, are to be kept in repair by the Landlord, and the cost of such repairs to be re-paid by the Tenant; as well as the cost of white-washing once a year, with the making good of any damaged plastering.
8. The Fences to be kept in repair by the Landlord, and the cost of the repair to be re-paid, in equal proportions, by the Tenants of the Cottages enclosed within such Fence.
9. The re-payment agreed to in the Clauses numbered 7 and 8, as above, to be made by the several tenants, within one week after payment thereof shall have been demanded by the Landlord's Agent.
10. The Tenant to clear away the ashes, and to remove all manure, &c., which may have been laid near the Cottage, every week.
11. The Gardens in front of the Cottages to be kept in good order, and the Cottages themselves in a neat and tidy state, to the satisfaction of the Landlord or his Agent.
12. Free access to be given, at all times, to the Landlord, his Agent, Servants, or Workmen.

FORM OF AGREEMENT.

________ *does hereby agree with*

to take of him the Cottage ____

________________ *from week to week, at the weekly rent of*

________________ *to be paid by the said* ________________ *to the said*

________________ *at the end of each week, subject to the terms and conditions above specified.*

As witness their hands, this __________ *day of* ______________ 185

Witness ________________

VIEW OF THE MODEL BUILDINGS NEAR BAGNIGGE WELLS,

Between the Lower Road, Pentonville, and Gray's-Inn Road.

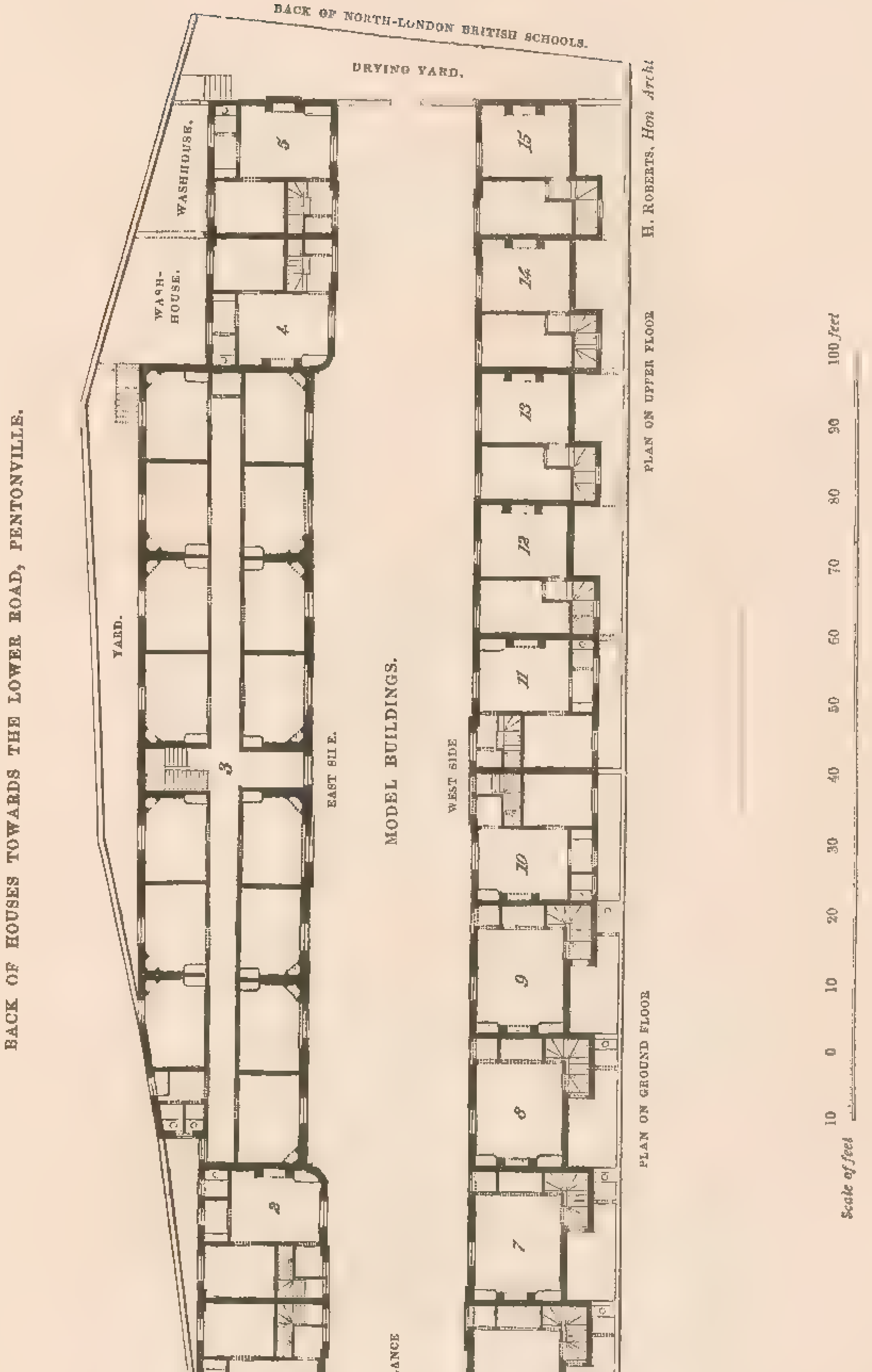
EXPLANATION OF THE ANNEXED PLAN.

The six houses, Nos. 1, 2, 4, 5, 10, and 11, are the residences of twelve families, each occupying a floor with two rooms; the larger 13ft. by 10ft., the smaller 10ft. 6in. by 7ft. 6in. All requisite conveniences are provided separately for each family, with distinct access to the upper floor.

The eight houses, Nos. 6, 7, 8, 9, 12, 13, 14, and 15, are the residences of eight families, each having on the ground floor a living-room, 13ft. 6in. by 12ft. 6in., with a lobby, enclosed recess for beds, closets, and a scullery under stairs, with a small court-yard: the upper floor, as shown by Nos. 12, 13, 14, and 15, is divided into two bed-rooms; the larger 12ft. 6in. by 10ft. 6in., the smaller 13ft. by 7ft. 6in.

The house, No. 3, is intended for the residence of thirty widows or aged females, each having a room, 12ft. 6in. by 8ft. 6in., approached by a corridor, lighted and ventilated in the centre and at both ends. A sunk wash-house, for the use of the inmates of this house, is provided at the back of No. 4, and one adjoining it, for the occasional use of the other tenants.

Additional houses, to accommodate three families, have been built on the east side of the ground, towards the entrance; these are not shown on the Plan.

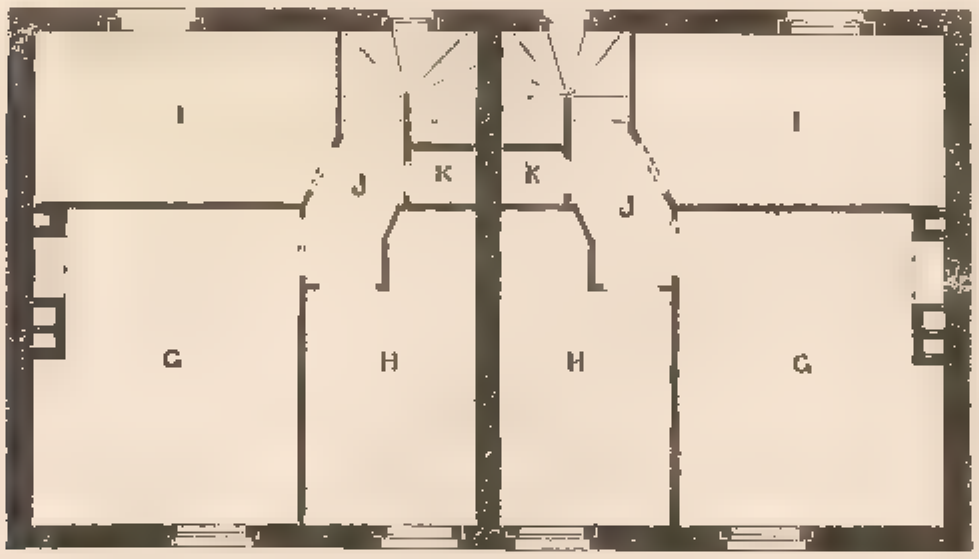

BACK OF HOUSES TOWARDS THE LOWER ROAD, PENTONVILLE.
BACK OF NORTH-LONDON BRITISH SCHOOLS.
DRYING YARD.
WASHHOUSE.
WASH-HOUSE.
YARD.
EAST SIDE.
MODEL BUILDINGS.
WEST SIDE
ENTRANCE
PLAN ON UPPER FLOOR
PLAN ON GROUND FLOOR
H. ROBERTS, Hon Archt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Scale of feet
10
0
10
20
30
40
50
60
70
80
90
100 feet

FOR WORKMEN'S DWELLINGS IN TOWNS,

TO BE BUILT IN PAIRS, OR IN A ROW.

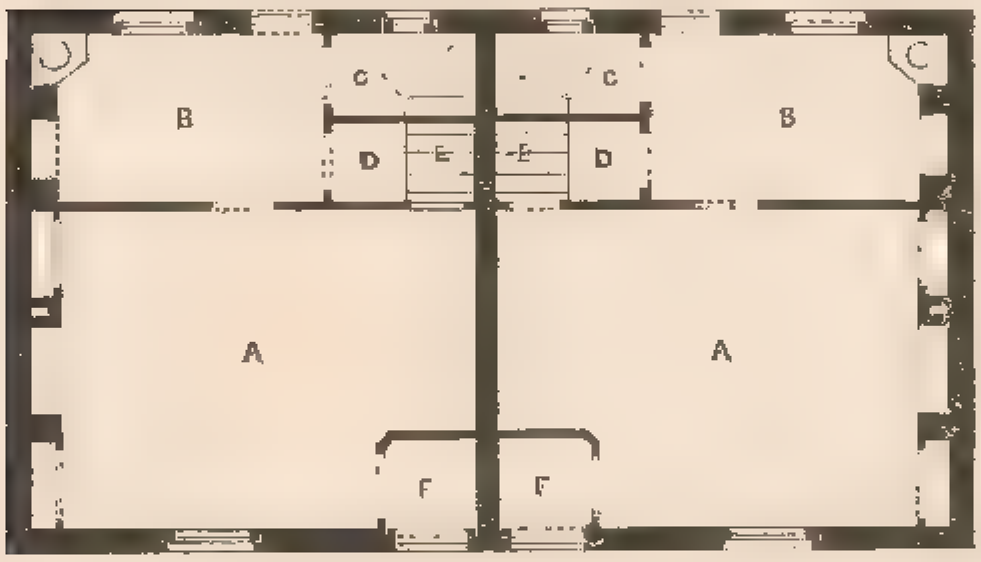
PLANS OF A DOUBLE HOUSE FOR ONE FAMILY IN EACH.

FIRST-FLOOR PLAN.



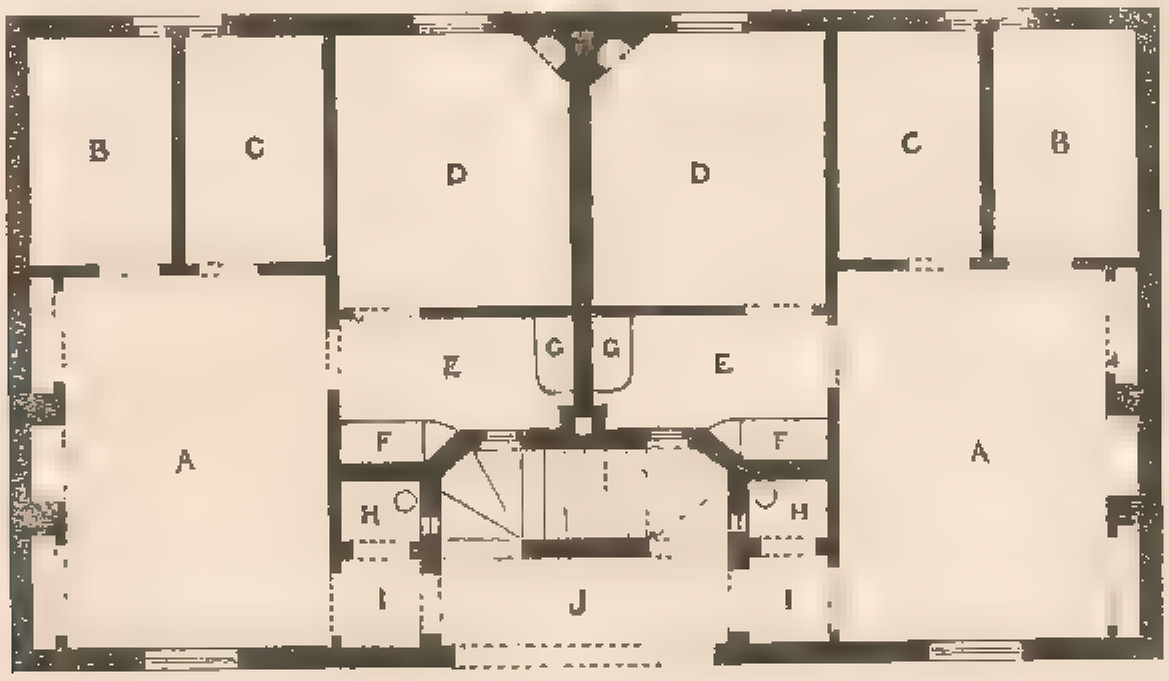
G Parents' Bed Room.
H Girls' Bed Room.
I Boys' Bed Room.
J Passage. K Closet.

GROUND-FLOOR PLAN.

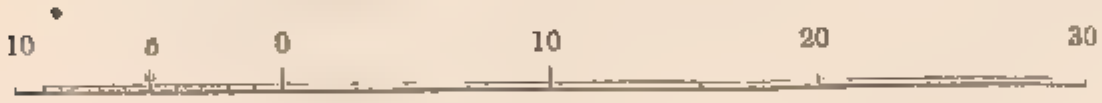


A Living Room.
B Scullery.
C Pantry.
D Fuel Store.
E Staircase.
F Porch.

PLAN of a DOUBLE HOUSE, with FOUR DISTINCT TENEMENTS on Two Floors, the Upper one being approached by an Open Staircase.

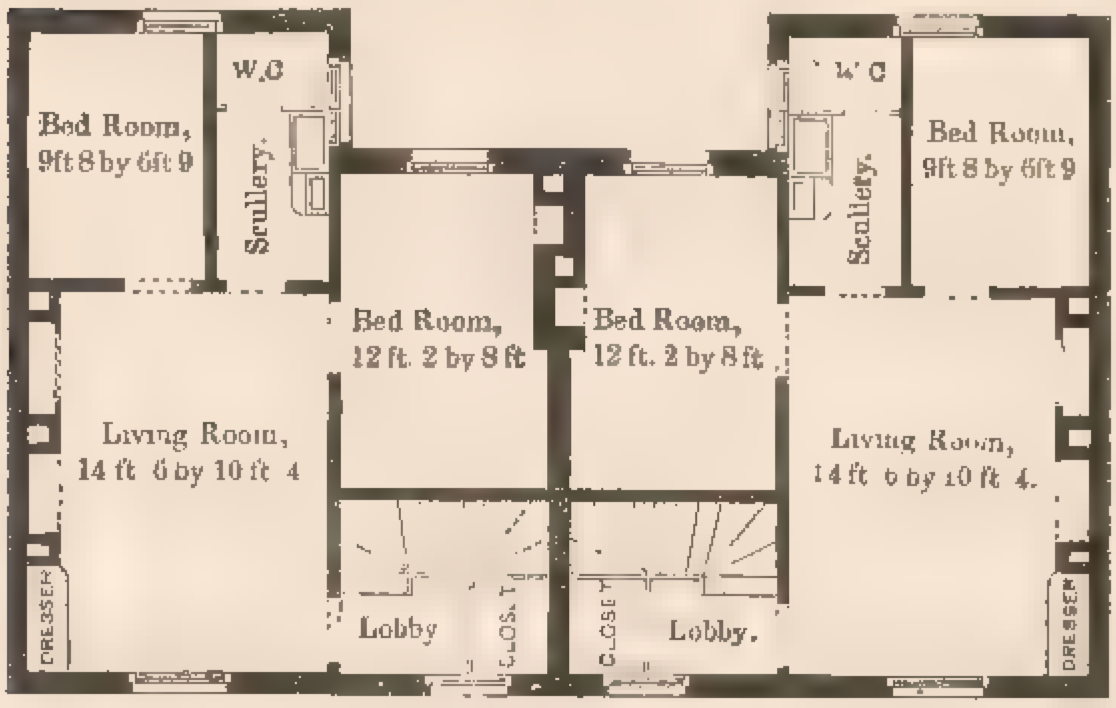


A Living Room.
B Boys'. C Girls'.
D Parents' Bed Room.
E Scullery.
F Safe.
G Sink.
H W. Closet.
I Lobby.
J Gallery.

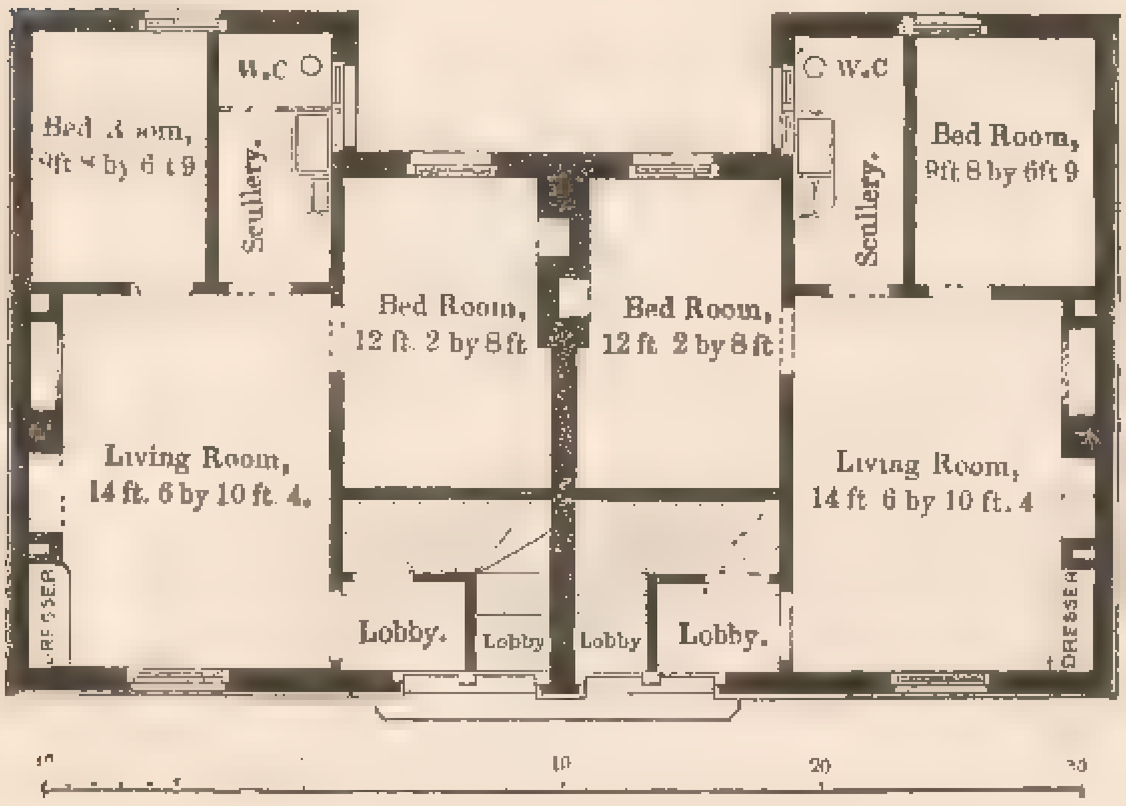


DOUBLE HOUSES ADAPTED TO TOWNS, WITH FOUR DISTINCT TENEMENTS ON TWO FLOORS, EACH HAVING TWO BED ROOMS.

ELEVATION.



PLAN OF UPPER FLOOR.

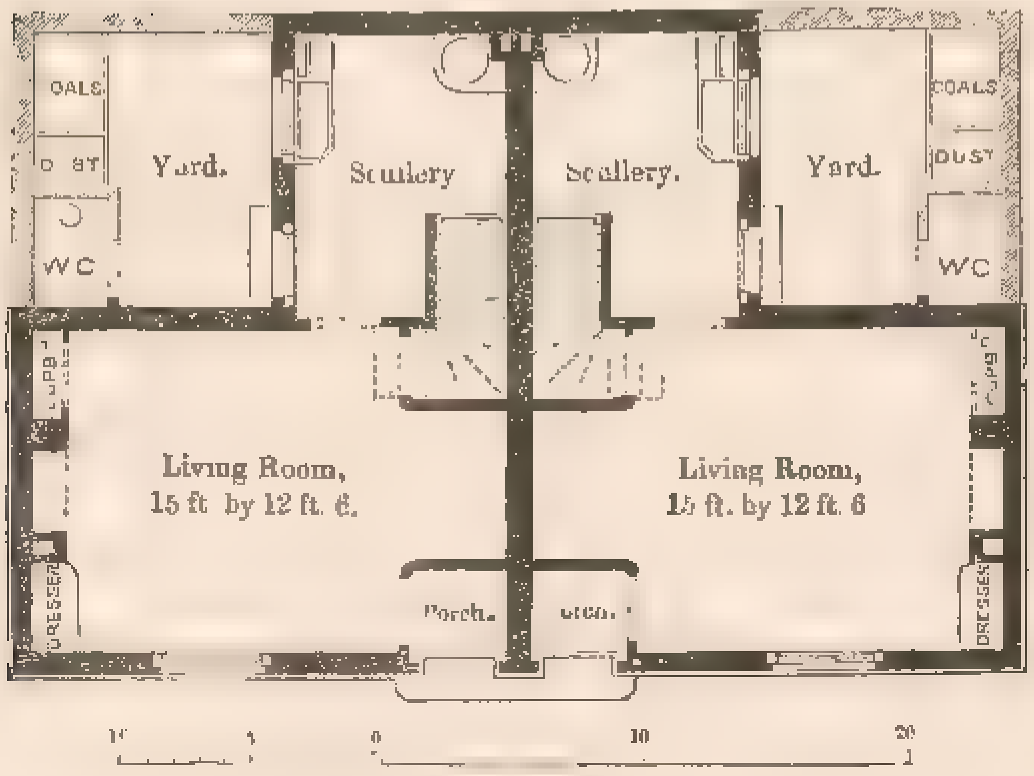


PLAN OF GROUND FLOOR.

DOUBLE HOUSES FOR FAMILIES, ADAPTED TO TOWNS, WITH THREE BED ROOMS EACH.

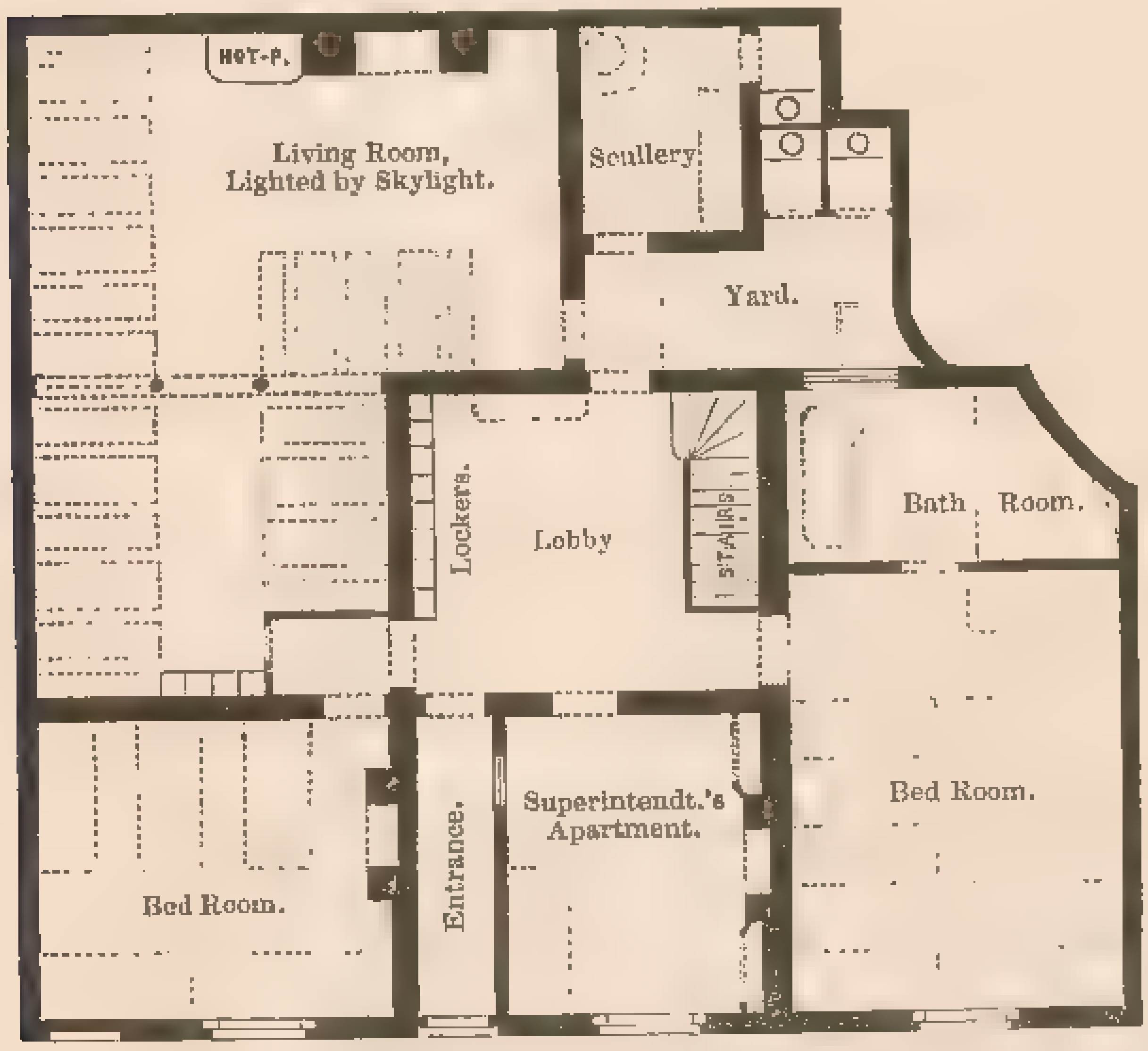
ELEVATION.

PLAN OF UPPER FLOOR.



PLAN OF GROUND FLOOR.

THE RENOVATED LODGING-HOUSE, CHARLES STREET, DRURY-LANE.

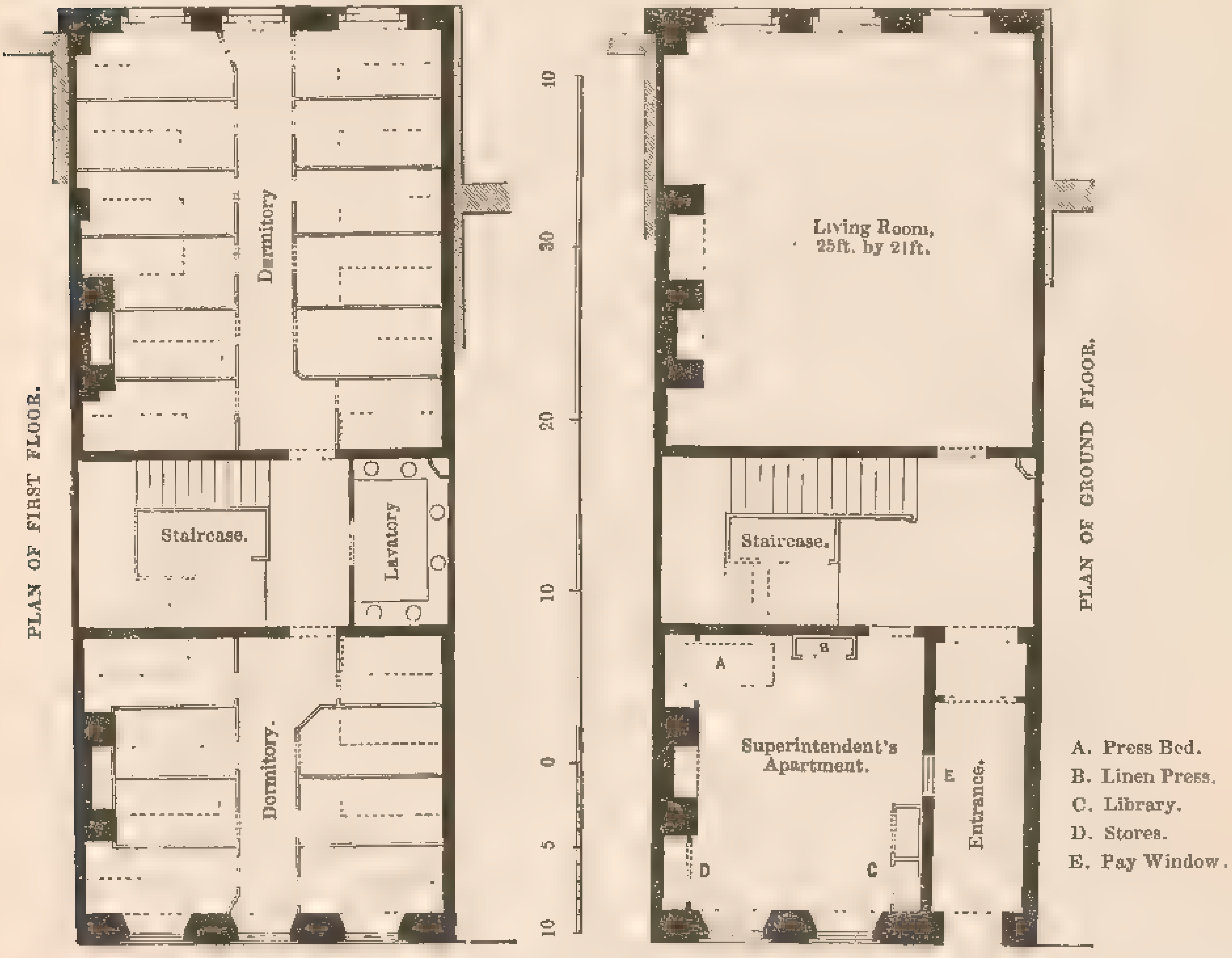


Ground-Floor Plan of the Renovated Lodging-House, Charles-street, Drury-lane, to accommodate 82 *Single Men.*

NOTE—This House was formed out of three old Houses.

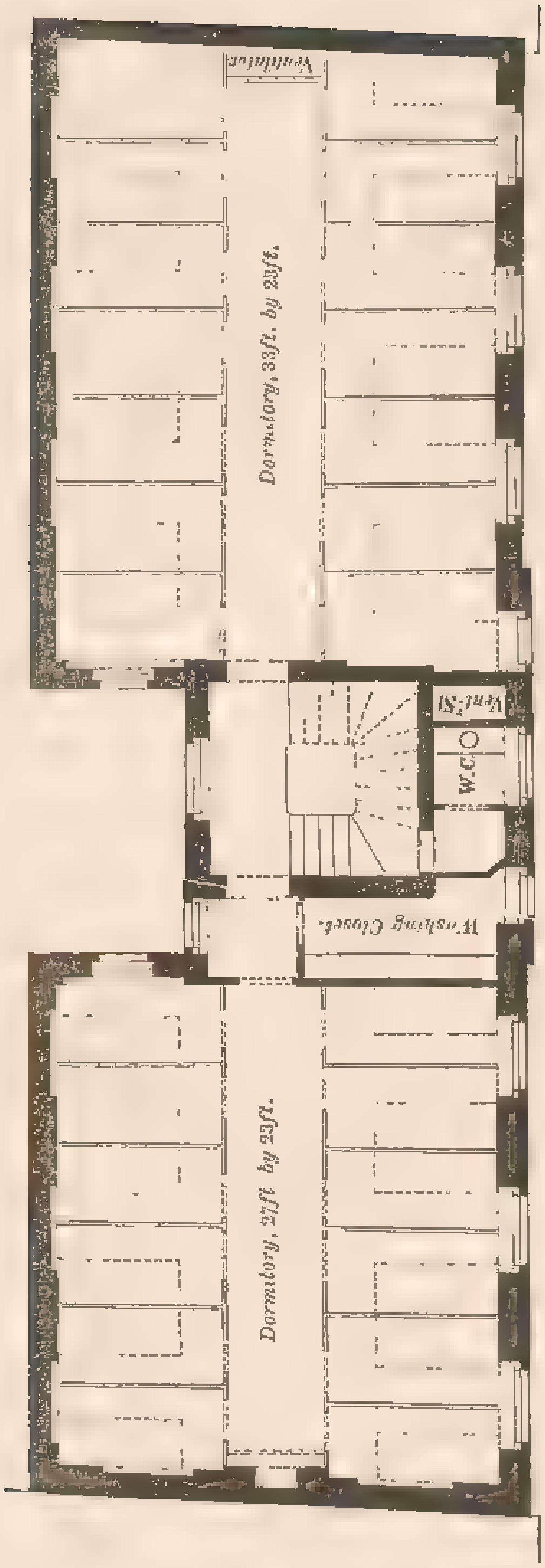
10 5 0 10 20 30 *feet.*

THE MODEL LODGING-HOUSE FOR 104 WORKING MEN, IN GEORGE-STREET.

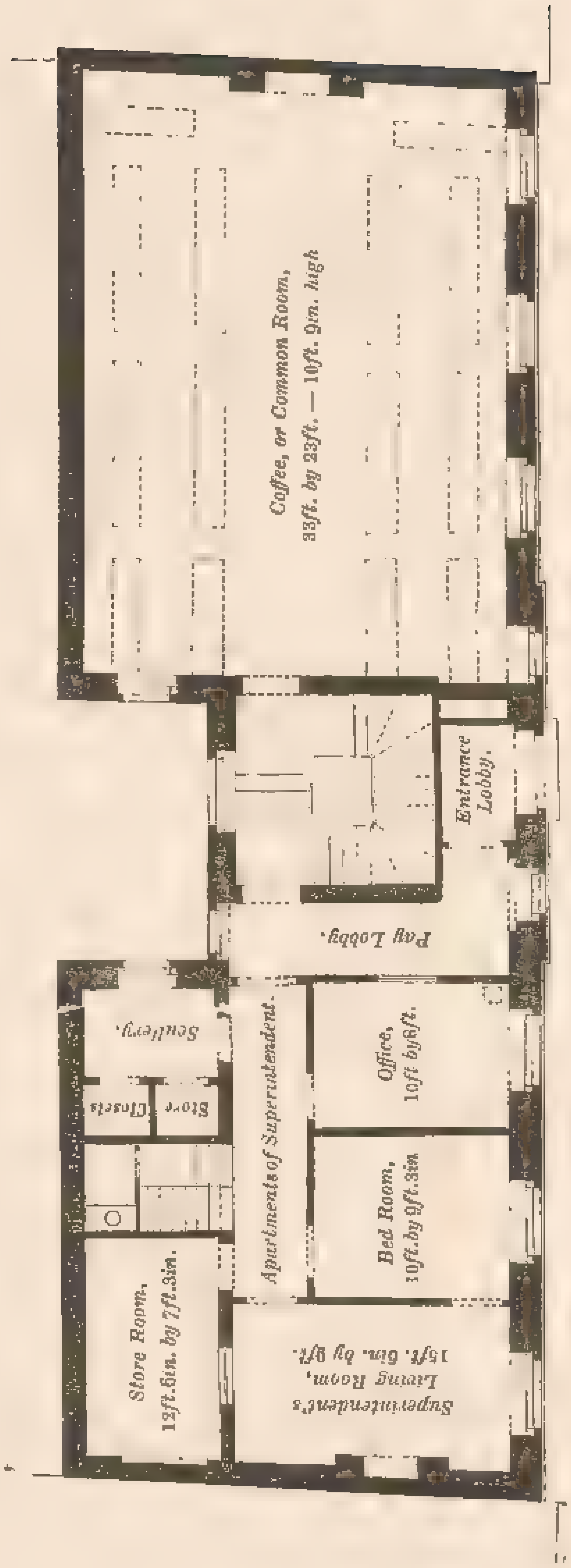


PLANS OF THE MODEL LODGING-HOUSE, No. 76, HATTON GARDEN.

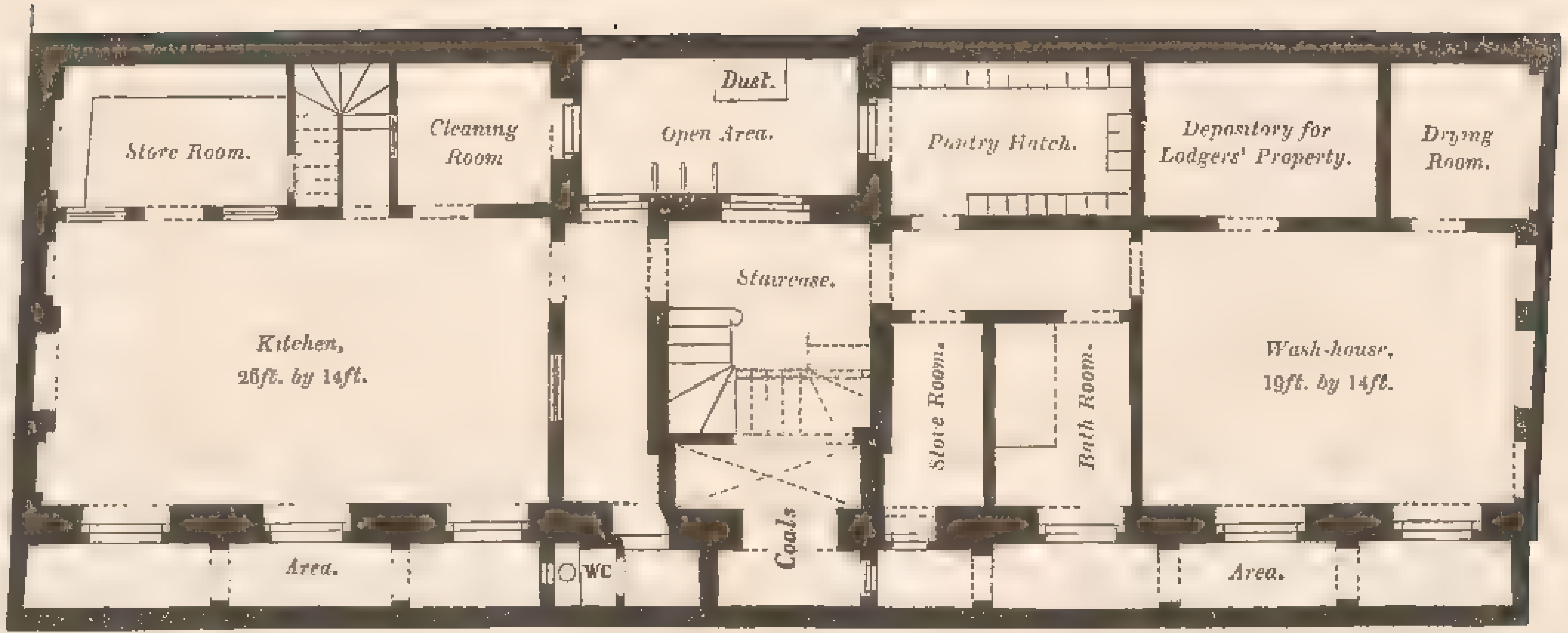
TO ACCOMMODATE 57 SINGLE WOMEN.



PLAN OF FOUR FLOORS OF DORMITORIES.



PLAN OF GROUND FLOOR.



H. Roberts, F.S.A., Hon. Archt.

PLAN OF BASEMENT FLOOR.

Scale of 10 5 0 10 20 30 40 50 feet.

THE MODEL LODGING-HOUSE IN GEORGE-STREET, BLOOMSBURY,

To Accommodate 104 Working Men.

SOUTH AND WEST SIDE OF INTERNAL QUADRANGLE TO MODEL HOUSES, STREATHAM-STREET,

THE ENCLOSURE WALL ON THE EAST SIDE BEING REMOVED.

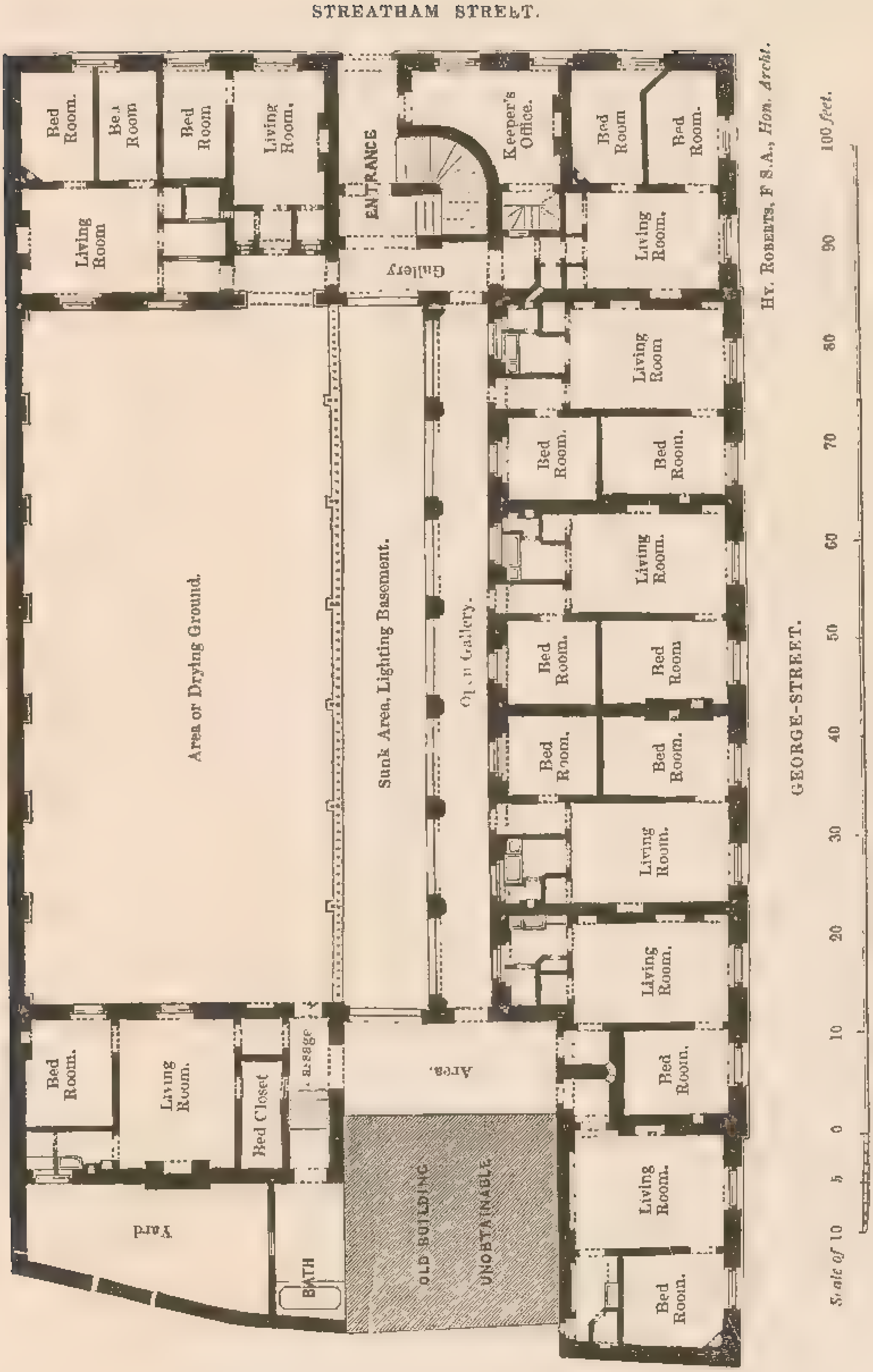
THE MODEL HOUSES FOR FAMILIES, IN STREATHAM STREET, BLOOMSBURY

THE MODEL HOUSES FOR FAMILIES IN STREATHAM-STREET, BLOOMSBURY,

TO ACCOMMODATE 48 FAMILIES, EXCLUSIVE OF THE SUNK BASEMENT-FLOOR,
IN WHICH THERE ARE SIX TENEMENTS.

PLAN OF UPPER FLOORS.

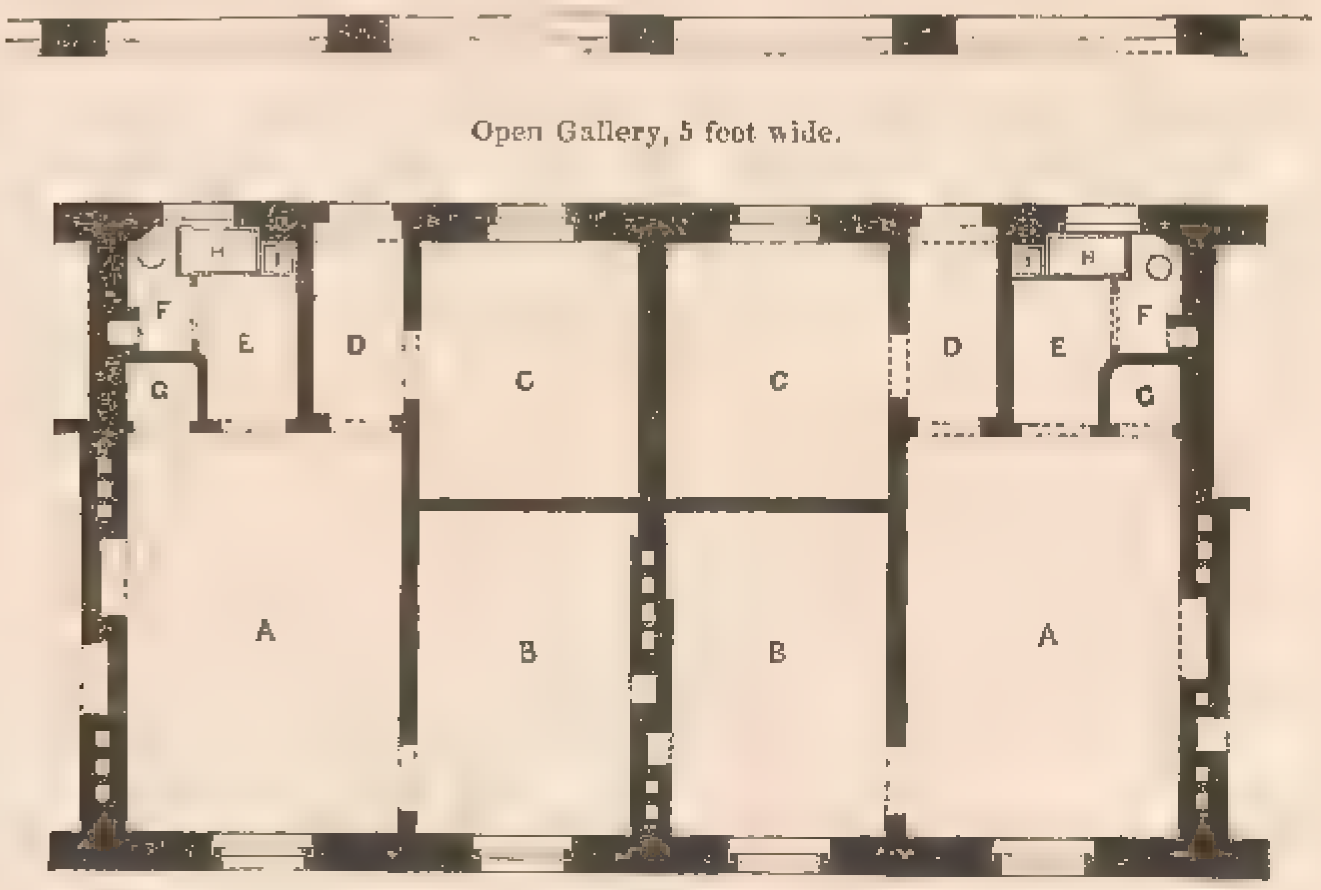
PLAN OF GROUND FLOOR.



Hy. Roberts, F.S.A., *Hon. Archt.*

PLAN OF TWO OF THE TENEMENTS IN THE STREATHAM-STREET MODEL HOUSES FOR FAMILIES,

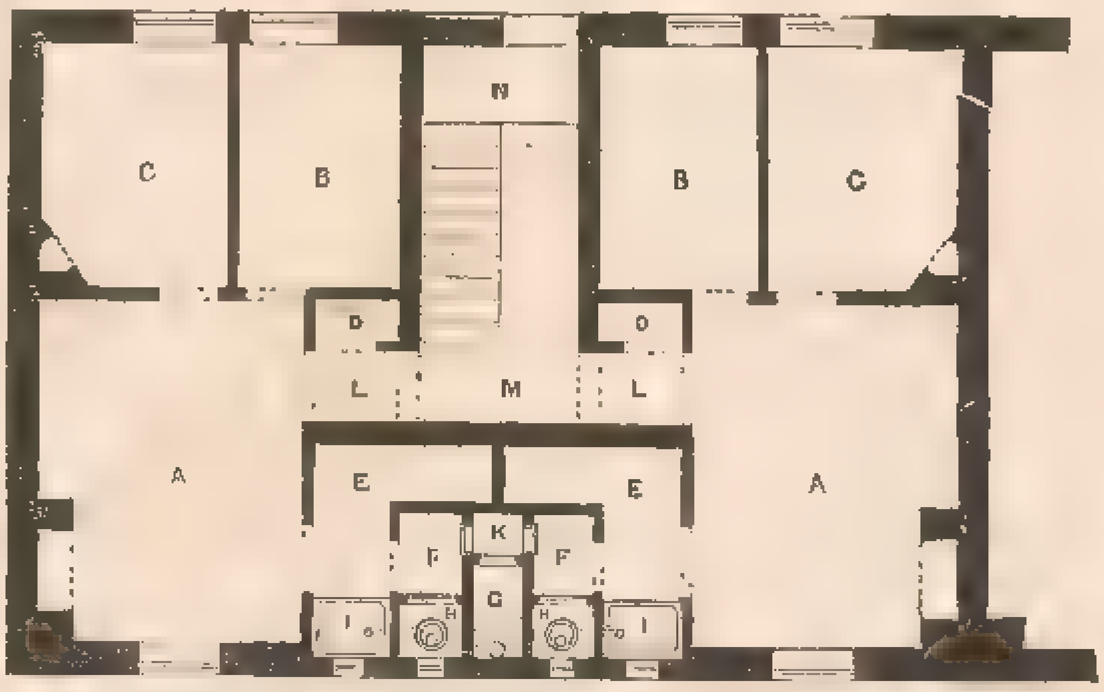
BUILT BY THE SOCIETY FOR IMPROVING THE CONDITION OF THE LABOURING CLASSES.



A Living Room.
B Bed Room.
C Bed Room.
D Lobby.
E Scullery.
F W. C. and Dust.
G Bed Closet.
H Sink.
I Meat Safe.

PLAN OF TWO OF THE TENEMENTS IN THE DWELLINGS FOR LABOURERS AT BIRKENHEAD,

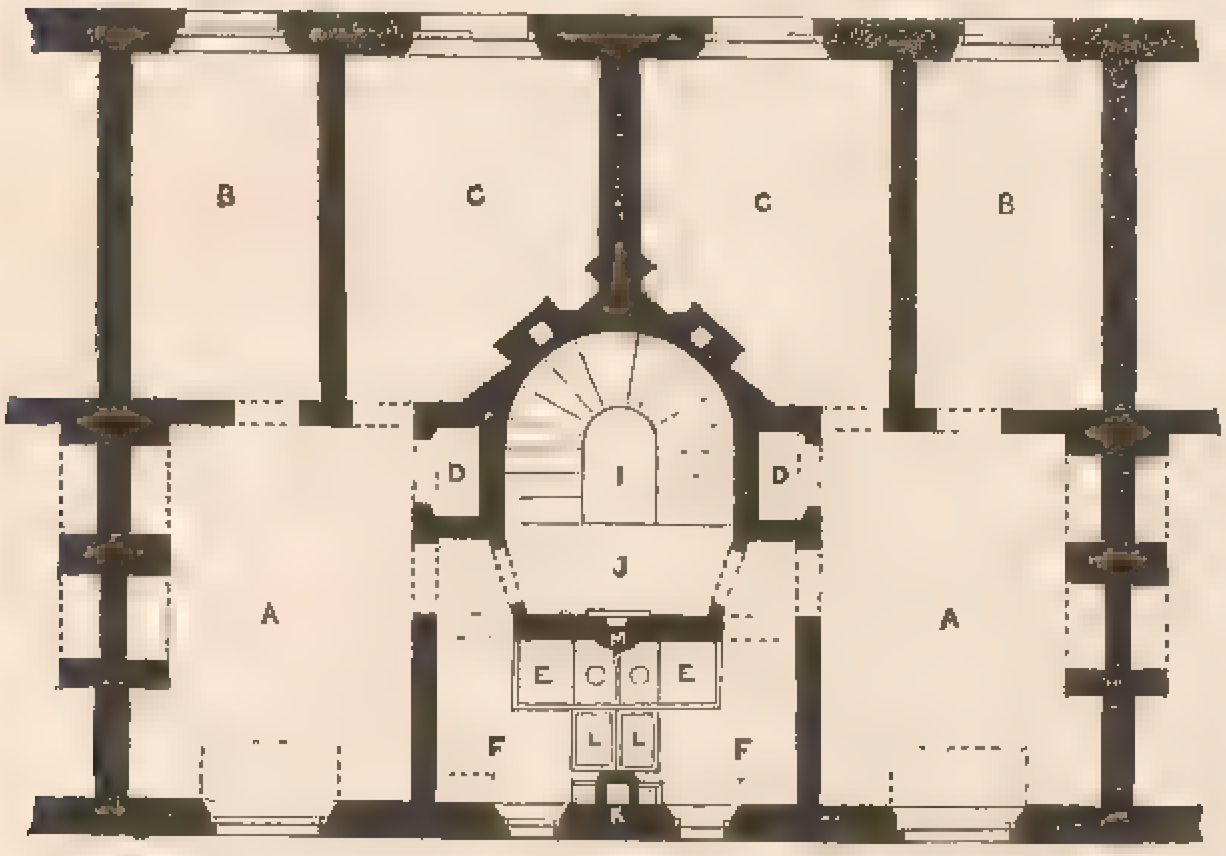
BUILT BY THE BIRKENHEAD DOCK COMPANY.



A Living Room.
B Bed Room.
C Bed Room.
D Cupboard.
E Scullery.
F W. Closet.
G Pipes.
I Sink.
L Lobby.
M Staircase Landing.
N Entrance.

PLAN OF TWO OF THE TENEMENTS IN THE FAMILY HOUSES FOR WORKMEN, ST. PANCRAS.

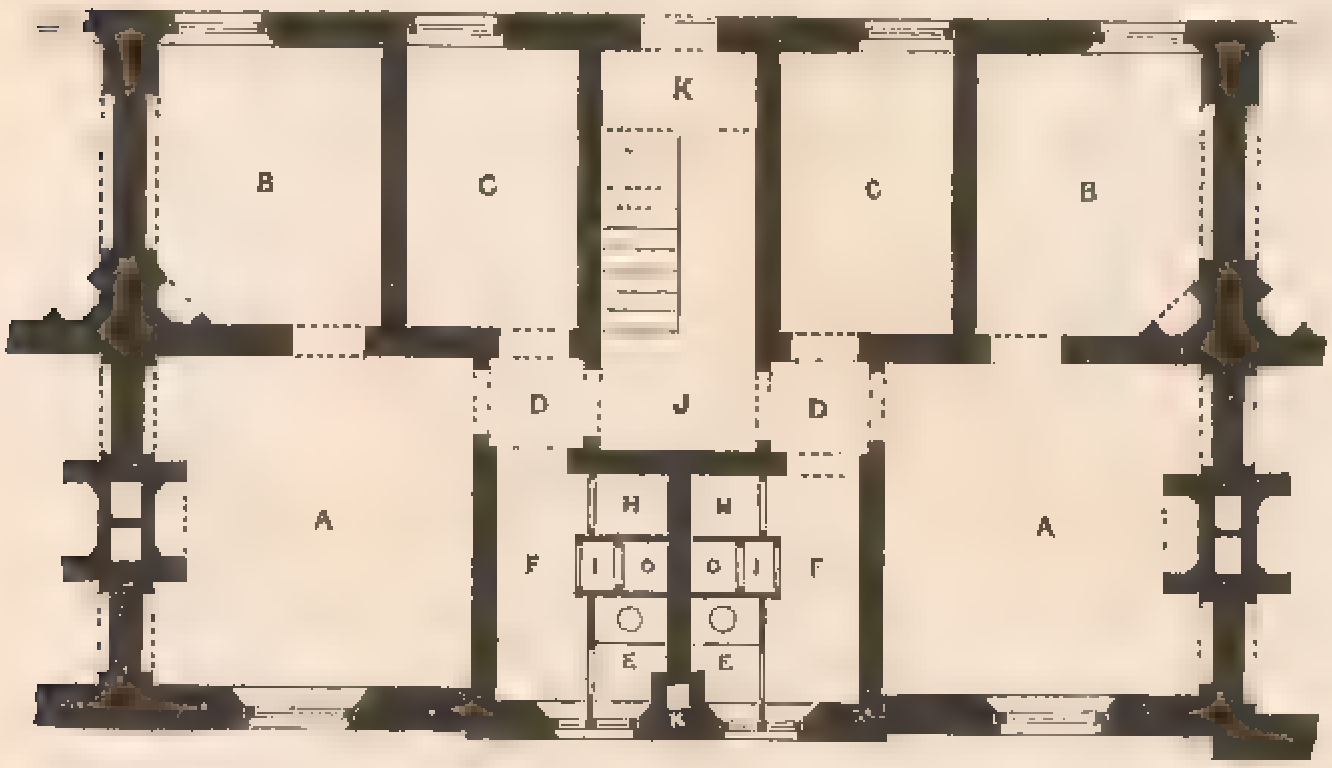
BUILT BY THE METROPOLITAN ASSOCIATION.



A Living Room.
B Bed Room.
C Bed Room.
D Cupboard.
E W. Closet.
F Scullery.
I Staircase.
K Dust Shaft.
L Sink.

PLAN OF TWO OF THE TENEMENTS IN THE FAMILY HOUSES FOR WORKMEN, SPICER-STREET.

BUILT BY THE METROPOLITAN ASSOCIATION.

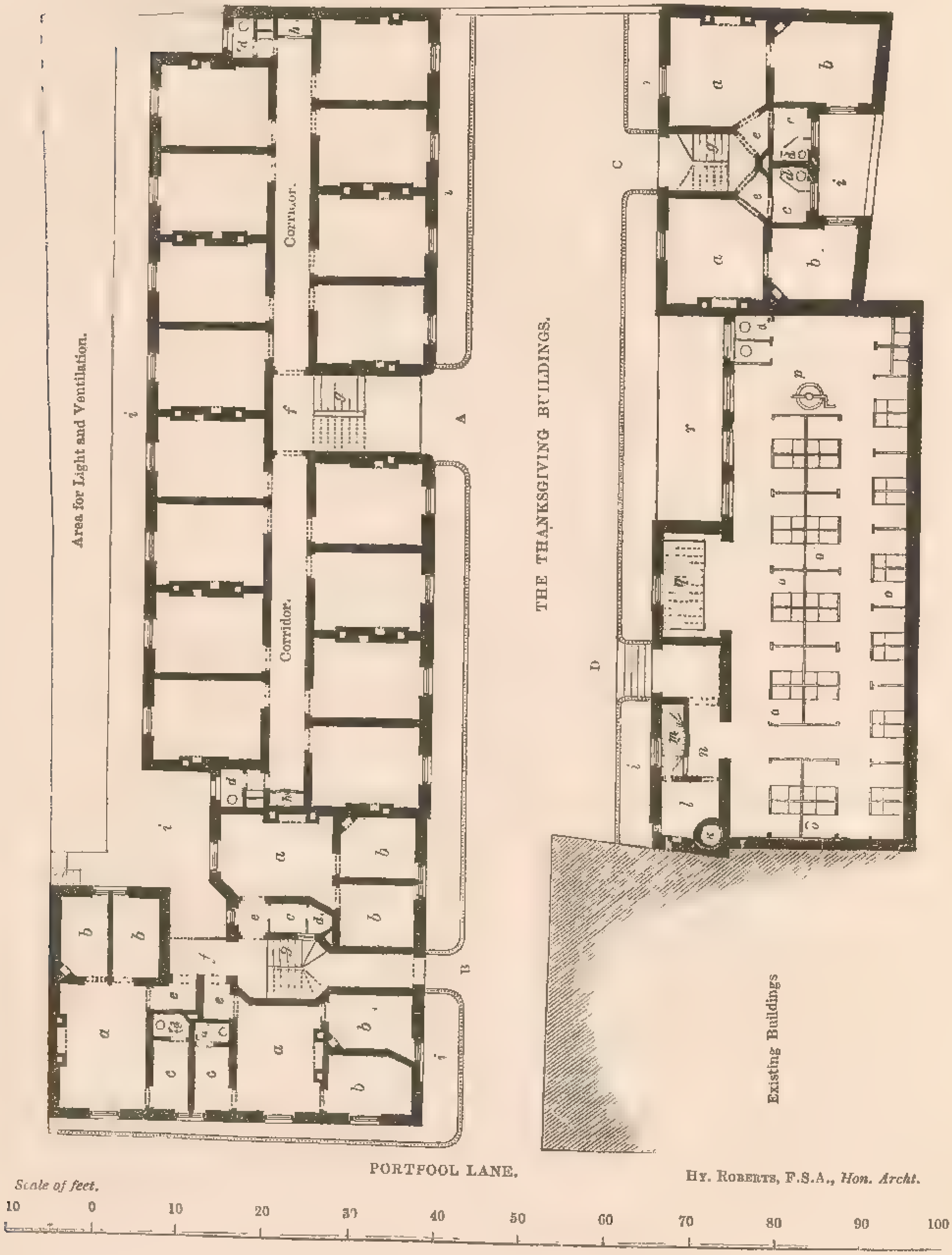


A Living Room.
B Bed Room.
C Bed Room.
D Lobby.
E W. C. and Dust.
F Scullery.
G Pantry.
H Cupboard.
I Sink.
J Landing of Staircase.
K Entrance.

THE THANKSGIVING MODEL BUILDINGS IN PORTPOOL LANE, GRAY'S-INN LANE.

Accommodating 20 Families and 128 Single Women,

INCLUDING A PUBLIC WASHHOUSE, WITH A CELLAR BENEATH FOR HUCKSTERS' GOODS.



Hy. Roberts, F.S.A., *Hon. Archt.*

VIEW OF THE EAST SIDE OF THE THANKSGIVING MODEL BUILDINGS, PORTPOOL LANE, GRAY'S INN LANE.

For these Buildings, as stated in a Note, p. 13, a spacious freehold site, eligibly situated in Portpool Lane, Gray's-Inn Lane, has been purchased, and Model Dwellings raised for twenty families, and for one hundred and twenty-eight single women; whilst an existing building has been converted into a Washhouse for the use of the neighbourhood, as well as of the tenants of the Model Dwellings, for whose use two Baths are also provided.

The twenty families occupy two distinct buildings, of four stories in height—one building having three tenements, with three rooms each on a floor; the other having two tenements, with two rooms each on a floor—a scullery and other requisite conveniences have been provided separately for each family, whilst to both houses there is an open staircase, and to the larger one a gallery of communication, by which means complete ventilation is secured. In their arrangement, it has been the aim of the Honorary Architect to show how the disadvantages of an enclosed common staircase may, in a great measure, be obviated; and to offer two models of houses, one adapted to the accommodation of two, and the other of three families on a floor.

The one hundred and twenty-eight single women, of whom the majority are supposed to be poor needlewomen, occupy sixty-four rooms, in a building of four stories, divided by a central staircase; a corridor on either side forms a lobby to eight rooms, each 12ft. 6in. long, by 9ft. 6in. wide, sufficiently large for two persons. They are fitted up with two bedsteads, a table, chairs, and a washing-stand. The charge is one shilling per week for each person, or two shillings per room. This building is intended to meet the peculiar and difficult circumstances of a class of persons on whose behalf much public sympathy has been justly excited, and for whom no suitable provision had hitherto been made by the Society.

The Washhouse, 60ft. long by 20ft. broad, (formerly a brewhouse,) has washing-troughs for thirty-four persons, and in a gallery ironing-tables for twelve persons; a wringing apparatus and twelve drying-horses, heated with hot water. The arrangements for this establishment are made with a view to avoid confusion, by keeping the various processes as distinct as possible.

In the Cellar under the Washhouse is provided a store for Coals, to be retailed to the tenants; also a range of enclosed depositories for perishable goods, such as fruit and vegetables, sold in the streets by the numerous Hucksters residing in this locality. As their miserable and crowded lodging-houses afford no secure and ventilated receptacle for their articles of trade when they quit the street, these depositories have been formed with a view to afford that advantage, and being closed from Saturday evening to Monday morning, may prove an inducement to abstinence from Sunday traffic, to which many of this class of persons appear to be almost driven by necessity.

With the exception of the Washhouse roof, the buildings are of *fire-proof* construction, similar to the plan adopted in the Society's Model Houses for Families in Streatham-street.

DESCRIPTION OF THE PLAN.

A Entrance to Model Building for 128 Single Women.
B Entrance to Model Building for Twelve Families.
C Entrance to Model Building for Eight Families.
D Entrance to Public Washhouse.

a Living-rooms. *b* Bed-rooms. *c* Sculleries. *d* Water-closets. *e* Entrance-lobbies. *f* Galleries and landings from staircase. *g* Staircases. *h* Enclosure for light and ventilation. *i* Sunk areas. *k* Chimney-shaft from boiler of washhouse. Pay-office for the Superintendent of the Washing Establishment, &c. *m* Staircase to the Gallery, with Ironing Tables, to the Baths, and to the dwelling apartments of the Superintendent. *n* Pay-lobby to Washhouse. *o* Washing troughs, with slate enclosures. *p* Wringing machine. *q* Sliding horses for drying linen. *r* Covered way leading down to the Store Cellar, under the Washhouse, for depositing Hucksters' goods, with trucks, &c.

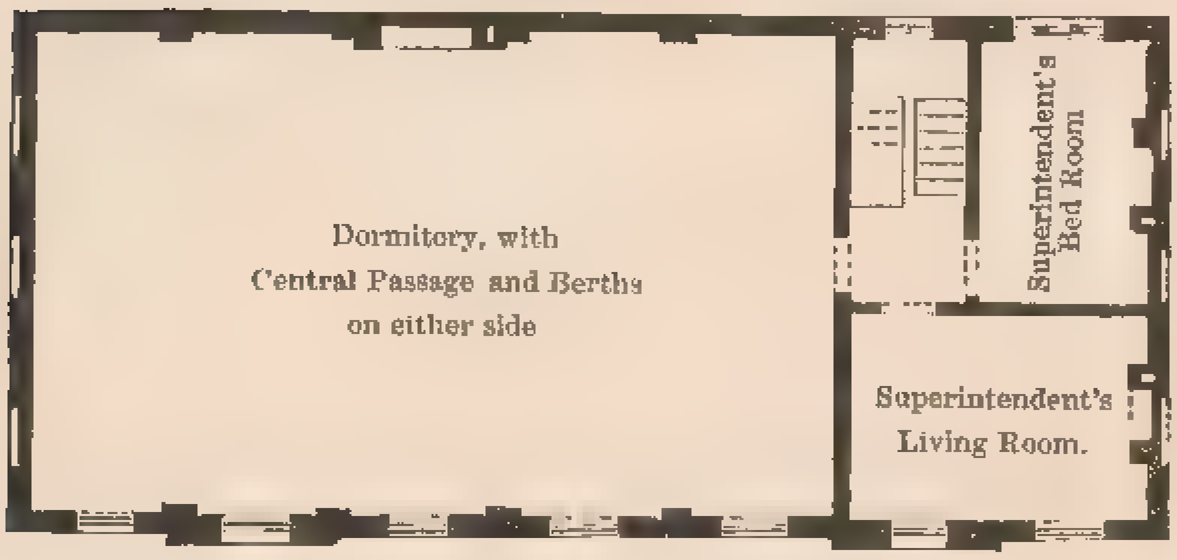
NOTE.—The Washhouse is lighted and ventilated from the roof, and has a Gallery on one side, with a range of Ironing tables.

THE ASYLUM FOR DESTITUTE SAILORS,

DOCK-STREET, LONDON DOCK.

ELEVATION.

PLAN OF DORMITORY FLOOR.



The open Roof extends over the Superintendent's Apartments, and is ventilated at each end. With an additional Story this building would accommodate with berths 150 persons.

PLAN OF GROUND FLOOR.

The Yard contains arrangements for Washing, and a Stove for Drying and Purifying Clothes, with a Bath and other requisite conveniences.

H.R.H. PRINCE ALBERT'S EXHIBITION MODEL HOUSES.

Amongst the vast collection of objects presented in the Great Exhibition of 1851, the visitor who estimated their real value and importance, not by the cost or labour of production, not by the artistic merit or gorgeous effect, but by their adaptation to advance the physical, the social, and the moral condition of the great masses of the people—of those who form the basis of the social edifice, would justly and gratefully appreciate the unpretending contribution made by His Royal Highness the Prince Albert, of *Model Houses for Families*, of the class of manufacturing and mechanical operatives.

His Royal Highness had this building raised on his own account, with a desire of conveying practical information calculated to promote the much needed improvement of the dwellings of the Working Classes, and also of stimulating Visitors to the Exhibition, whose position and circumstances enable them to carry out similar undertakings, and thus without pecuniary sacrifice, permanently to benefit those who are greatly dependent on others for their home and family comforts.

In its *general arrangement*, the building is adapted for the occupation of four families of the class of manufacturing and mechanical operatives, who usually reside in towns, or in their immediate vicinity; and as the value of land, which leads to the economizing of space, by the placing of more than one family under the same roof, in some cases, renders the addition of a third story desirable, the plan has been suited to such an arrangement, without any other alteration than the requisite increase in the strength of the walls.

The most prominent peculiarity of the design is that of the receding and protected central open staircase, with the connecting gallery on the first floor, formed of slate, and sheltered from the weather by the continuation of the main roof, which also screens the entrances to the dwellings.

The four tenements are arranged on precisely the same plan, two on each floor.

The entrance is through a small *lobby*, lighted from the upper part of the door.

The *living-room* has a superficial area of about 150 feet, with a closet on one side of the fire-place, to which warm air may be introduced from the back of the range; over the fire-place is an iron rod for hanging pictures; and on the opposite side of the room a shelf is carried above the doors, with a rail fixed between them.

The scullery is fitted up with a sink, beneath which is a coal-bin of slate; a plate-rack at one end, drained by a slate slab into the sink, covers the entrance to the dust-shaft, which is enclosed by a balanced self-acting iron door. The dust-shaft leads into a closed depository under the stairs, and has a ventilating flue, carried up above the roof. The meat safe is ventilated through the hollow brickwork, and shelves are fixed over the doors. A dresser-flap may be fixed against the partition.

The *sleeping apartments*, being three in number, provide for that separation which, with a family, is so essential to morality and decency. Each has its distinct access, and a window into the open air; two have fire-places.

The children's bed-rooms contain 50 feet superficial each, and, opening out of the living-room, an opportunity is afforded for the exercise of parental watchfulness, without the unwholesome crowding of the living-room, by its use as a sleeping apartment.

The parents' bed-room, with a superficial area of about 100 feet, is entered through the scullery—an arrangement in many respects preferable to a direct approach from the living-room, particularly in case of sickness. The recess in this room provides a closet for linen. In each of the bed-rooms a shelf is carried over the door, with a rail fixed beneath it.

The water-closet is fitted up with a Staffordshire glazed basin, which is complete without any wood fittings, and supplied with water from a slate cistern in common of 160 gallons, placed on the roof over the party and staircase walls. The same pipes which carry away the rain water from the roof serve for the use of the closets.

Constructive Arrangement.—The peculiarities of the building in this respect are, the exclusive use of hollow bricks for the walls and partitions, (excepting the foundations, which are of ordinary brickwork,) and the entire absence of timber in the floors and roof, which are formed with flat arches of hollow brickwork, rising from 8 to 9 inches, set in cement, and tied in by wrought-iron rods connected with cast-iron springers, which rest on the external walls, and bind the whole structure together; the building is thus rendered fire-proof, and much less liable to decay than those of ordinary construction. The roof arching, which is levelled with concrete, and covered with patent metallic lava, secures the upper rooms from the liability to changes of temperature to which apartments next the roof are generally subject, and the transmission of sound, as well as the percolation of moisture, so common through ordinary floors, is effectually impeded by the hollow-brick arched floors. The external and main internal walls are of patent bonded brickwork.

The advantages afforded by the use of hollow bricks in securing an effective system of insensible *ventilation*, deserves particular notice. Fresh air is admitted from a suitable point of the exterior of the building to a chamber at the back of the living-room fireplace, where, being warmed, it may be conducted to any convenient place of exit above the level at which the fresh air is admitted. Vitiated air may be conveyed either into the chimney flue or to any other suitable place of exit through the upper wall courses.

The glazed surface of the bricks used in the two upper-floor living-rooms, and at the foot of the staircase, shows a very superior mode of superseding all plastering and colouring.

The fire-proof construction, and the general arrangement of the fittings, are such as have been used in the Model Houses built by the Society for Improving the Condition of the Labouring Classes, under the direction of the Author, who also acted as honorary architect to this building.

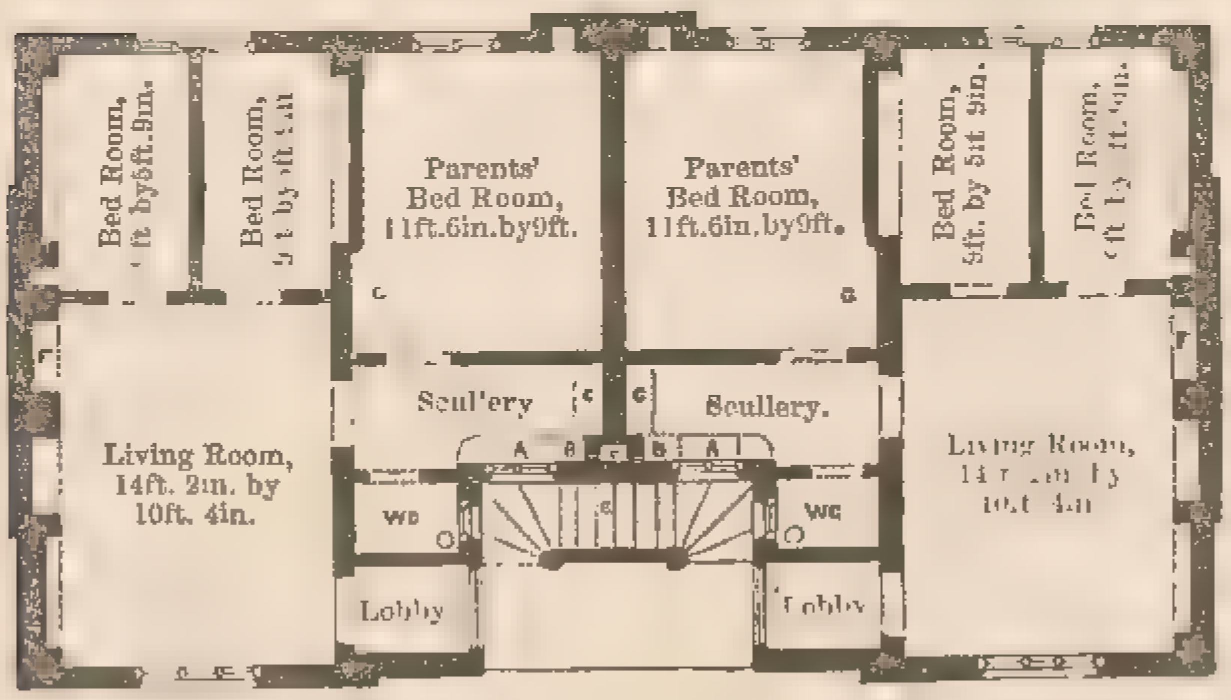
MODEL HOUSES FOR FOUR FAMILIES,

ERECTED BY COMMAND OF

HIS ROYAL HIGHNESS PRINCE ALBERT, K.G.,

AT THE EXPOSITION OF THE WORKS OF INDUSTRY OF ALL NATIONS, 1851,

And subsequently rebuilt in Kennington New Park, Surrey.



A Sink, with Coal Box under.
B Plate Rack over entrance to Dust Shaft, D
C Meat Safe, ventilated through hollow bricks.

E Staircase of Slate, with Dust Place under.
F Cupboard warmed from back of Fireplace.
G Linen Closet in this recess if required.

Scale of 5 0 10 20 30 40 feet.

THE WINDSOR ROYAL SOCIETY,

UNDER THE PATRONAGE OF HER MAJESTY THE QUEEN, AND OF H.R.H. THE PRINCE CONSORT.

This Society, formed in 1852 to promote and carry out the improvement of the dwellings of the working classes in Windsor, is constituted on the principle of a joint stock company, with a capital of 6000*l.*, to be raised in 10*l.* shares, and is empowered to increase the same, which has been subsequently done to 10,000*l.* The amount of dividend payable to the shareholders is limited to 5 per cent., leaving any surplus return available for the extension of the Society's operations. Donations are also received from those who prefer thus aiding the objects of the Society, but they are to be strictly applied to office expenses, or to such other outlay as may fairly be considered to be peculiar to the working of a company in distinction from the operations of a private builder.

Freehold ground, between the Long Walk and the Cavalry Barracks, containing nearly 1½ acre, has been purchased for 288*l.*, and laid out for the erection of two rows of houses, opposite one another, together accommodating about forty families, each having a small garden.

The contract for building one half of these houses amounts to 2240*l.* They are arranged in five blocks, the centre block, and the two corner blocks, each combining two plans, and the remaining blocks being alike in plan. There are four tenements on each of these five plans, twelve of them have three, and eight have two bed-rooms.

The centre building, 90 feet in length, contains eight tenements,—four on the ground-floor, and four on the upper-floor. The middle compartment, which is on the plan of H.R.H. Prince Albert's Exhibition Model Houses, somewhat increased in scale, consists of four tenements, each having three bed-rooms. On either side is a house arranged for two families, one above the other, with distinct entrance access—these tenements have two bed-rooms. The floor between the two stories is of hollow brick, fire-proof.

The next building, on either side, 36 feet in length, is a pair of double cottages, with living-room, scullery, pantry, and three bed-rooms above.

Each of the two extreme buildings, 70 feet in length, comprises four cottages, with living-room, scullery, and pantry; the centre cottages have two bed-rooms above, the two outer cottages have three bed-rooms above.

The centre building on the opposite side, which cost about £320, combines a superintendent's residence, a bake-house, wash-house, bath, fuel store, and a 3000 gal. slate cistern for the general supply of the houses.

The arrangement of the several buildings is shown on the annexed plans. They are constructed in hollow bricks, similar to those used in the Exhibition Model Houses.

With a view to facilitate the adoption, in other places, of the plans of these buildings, designed by the Author, who has acted as honorary architect to the Windsor Royal Society, working drawings have been lithographed, and are published by the Society for Improving the Condition of the Working Classes, 21, Exeter Hall.

A spacious house has been taken by the same Society, and fitted up as a lodging-house for 50 single men; its arrangement being, in many respects, applicable to other places, plans of the several floors are given. See page 64.

A statement having been published of the cost of the above-described houses, which is based exclusively on the amounts given for each set or block of cottages in the *lowest* Tender, in order to prevent an erroneous conclusion being drawn therefrom as to the relative cost of the several blocks of building, the following abstract is given of the *two lowest* Tenders, and the *average* amounts of the five Tenders made the 31st May, 1852, in answer to public advertisement.

	Lowest Tender.	Per Tenement.		Next Lowest Tender.	Per Tenement
The centre block of houses for 8 families .	£868 0 0	or 108 10 0	...	£775 13 9	or 96 19 3
Two pair of double cottages for 4 families .	420 0 0	,, 105 0 0	...	476 3 2	,, 119 0 9
Two blocks of houses for 8 families . . .	834 0 0	,, 104 5 0	...	863 17 6	,, 107 19 8
Extra concrete to foundations, soft water and manure tanks, cesspools, and drains	118 5 0	... ...	...	127 10 0	
	£2240 5 0			£2243 4 5	

Average amounts of the five tenders.

The centre block of houses for 8 families . .	£946 10 9	or 118 6 4 per tenement.
Two pair of double cottages for 4 families . .	560 0 7	,, 140 0 2 ditto.
Two blocks of houses for 8 families	1077 11 6	,, 134 14 0 ditto.
Extra concrete to foundations, soft water and manure tanks, cesspools, and drains . .	125 16 8	
	£2709 19 6	

It ought, further, to be observed that, for the tenements in the centre block (which are arranged in flats on two stories), the extent of frontage occupied, the relative cost of drainage, of water supply, of fencing, and of road-making, is less in proportion per tenement than to the self-contained houses.

The highest weekly rents, including rates and taxes, which under ordinary circumstances ought to be expected for such tenements, are 3*s.* 6*d.* for those with two bed-rooms, and 4*s.* 6*d.* for those with three bed-rooms, in the centre block; 4*s.* for the two-bed-roomed, and 5*s.* for the three-bed-roomed tenements in the self-contained cottages. Higher charges than these might lead, in the three-bed roomed houses, to the very objectionable practice of taking in lodgers.

In many places where building is less expensive than at Windsor, the rents would be remunerative at a lower rate.

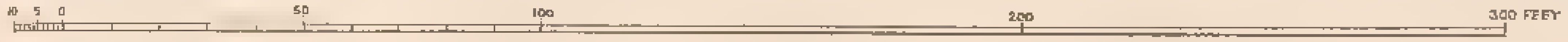
PLAN, SHOWING THE COTTAGES FOR TWENTY FAMILIES, BUILT BY THE WINDSOR ROYAL SOCIETY.

UNDER THE AUTHOR'S DIRECTIONS AS HONORARY ARCHITECT, 1852-3.

The Nos. on the blocks indicate the number of bedrooms in the separate tenements.

The building S contains a residence for Superintendent, with a bakehouse, washhouse, bath, fuel store, and tank, for the general supply of the houses.

On the unoccupied space at each side of the building S, it has been proposed to erect either two blocks of houses for eight families, similar to the centre building, with a block of double cottages at the extremities; or to form a hollow square round the building S, with four blocks of five cottages, two of them facing the public roads, and the others facing the existing buildings In either case twenty additional families would be provided for, making forty tenements in the whole.

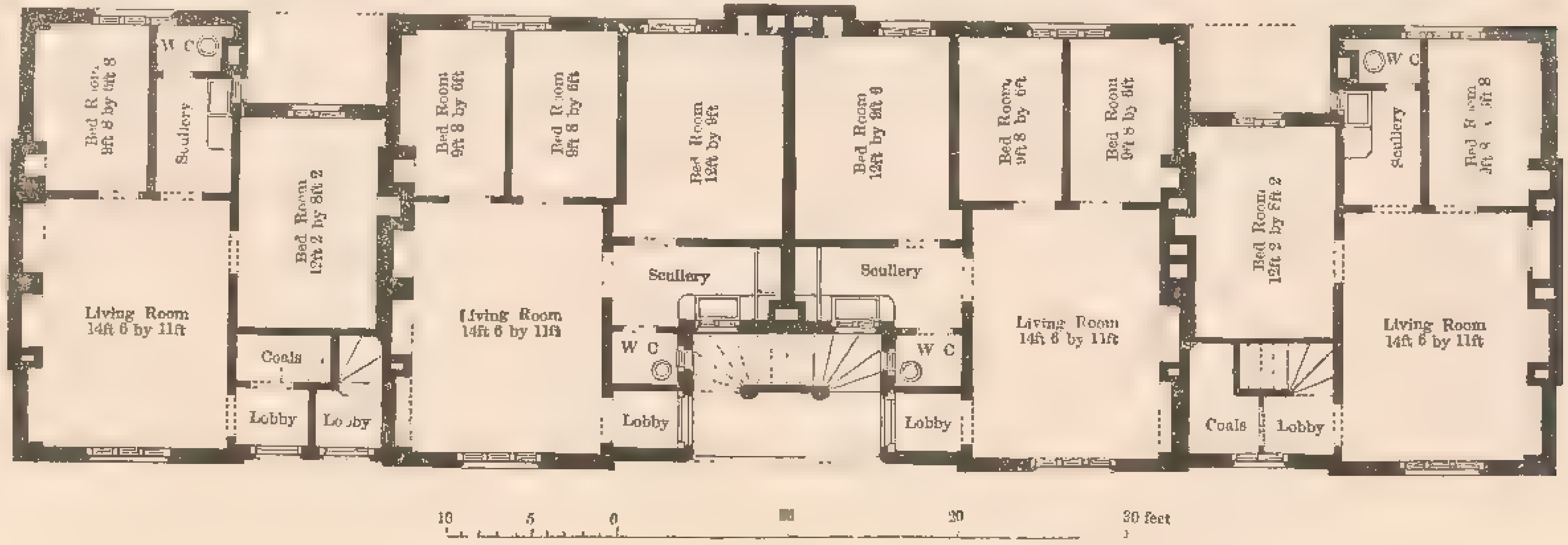


THE WINDSOR ROYAL SOCIETY'S COTTAGES FOR THE WORKING CLASSES.

WINDSOR ROYAL SOCIETY'S COTTAGES.

ELEVATION OF THE CENTRE BUILDING.

PLAN OF THE CENTRE BUILDING FOR EIGHT FAMILIES.

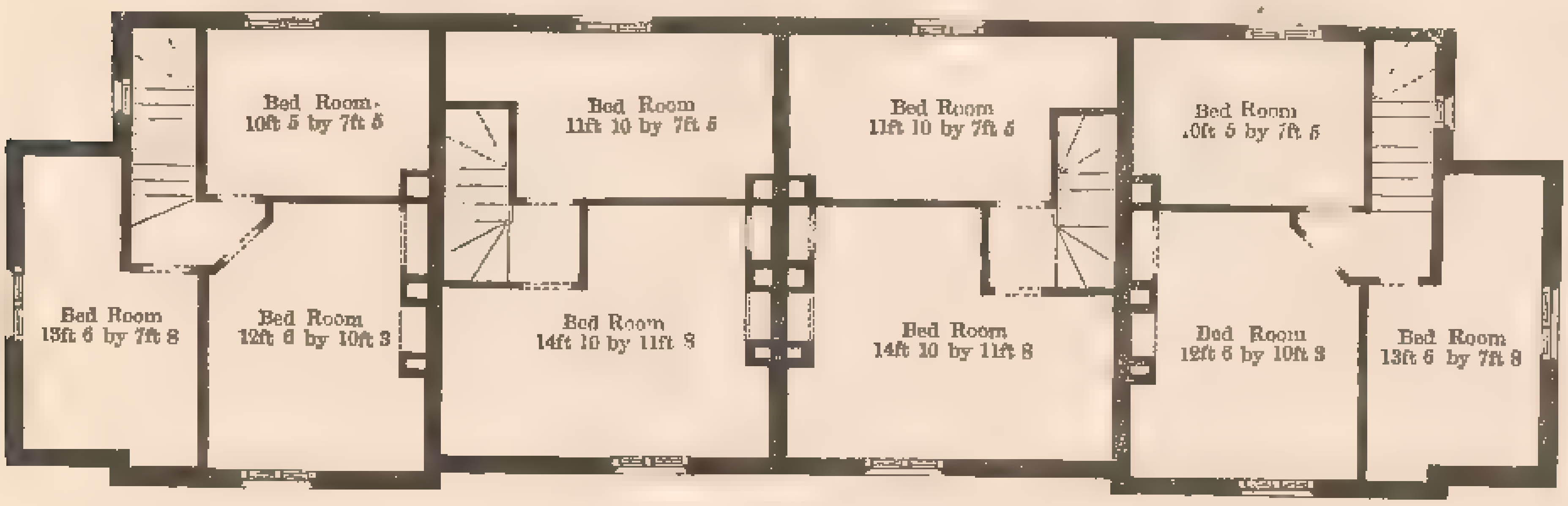


GROUND FLOOR PLAN.

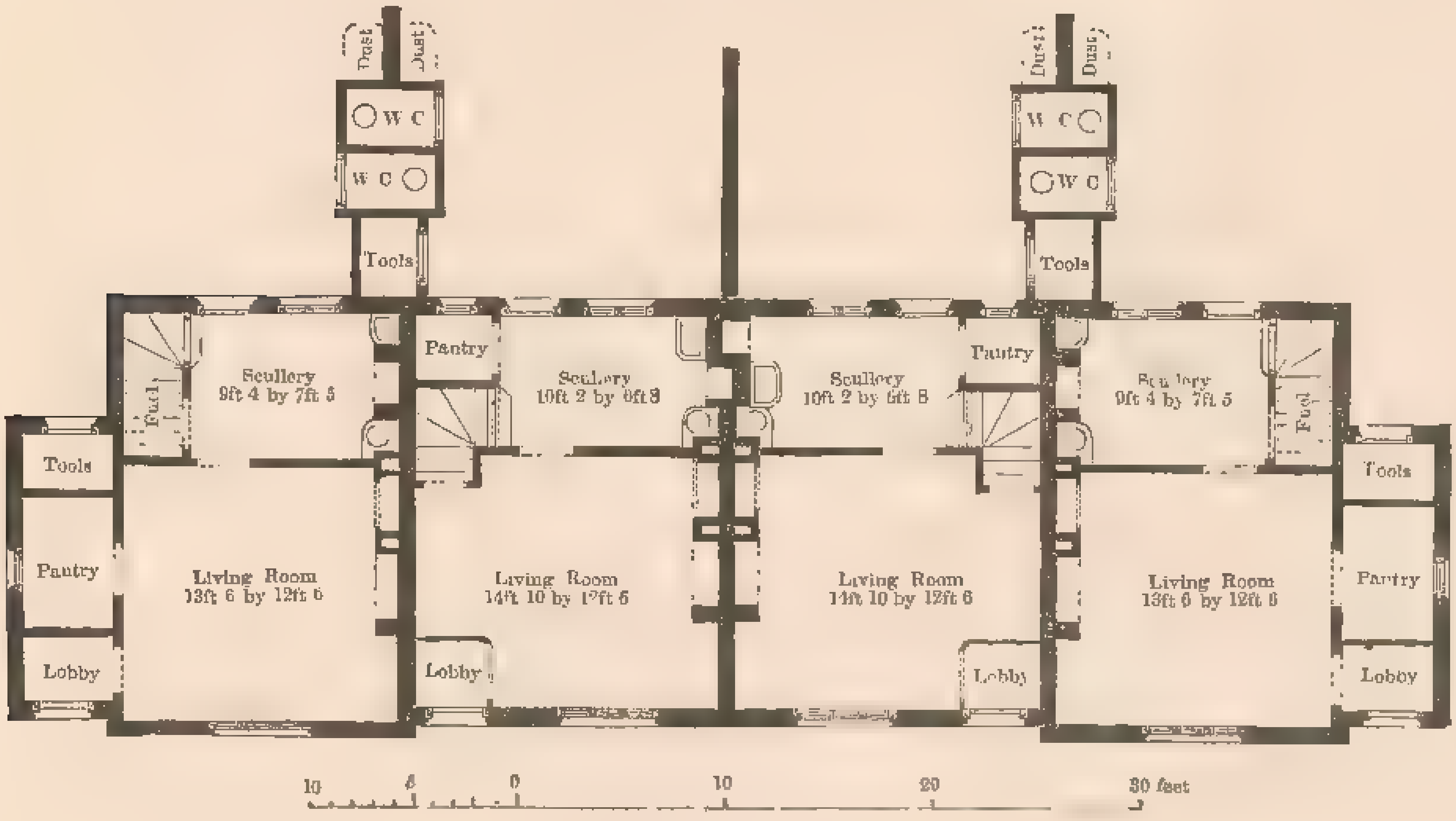
UPPER FLOOR PLAN.

WINDSOR ROYAL SOCIETY'S COTTAGES.

PLANS OF THE COTTAGES FOR FOUR FAMILIES.



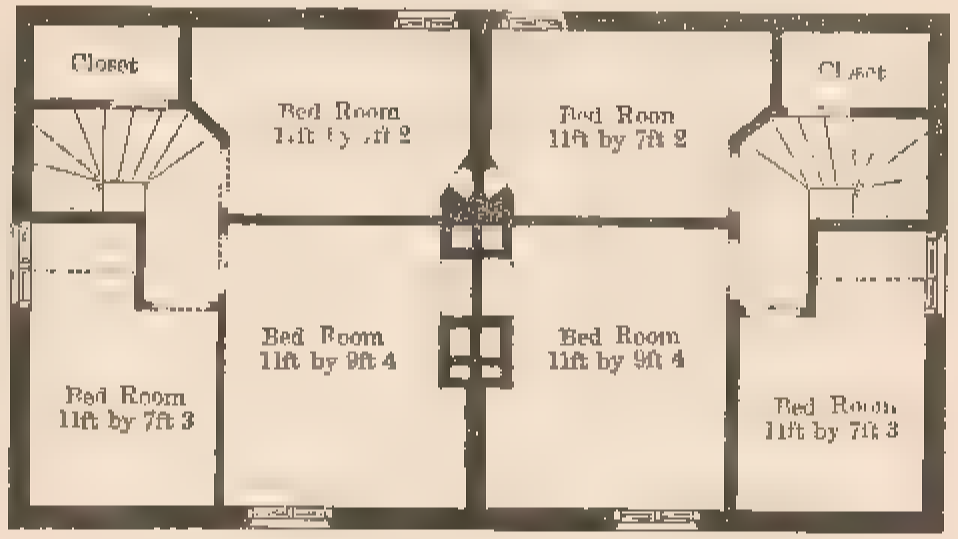
BED-ROOM FLOOR PLAN.



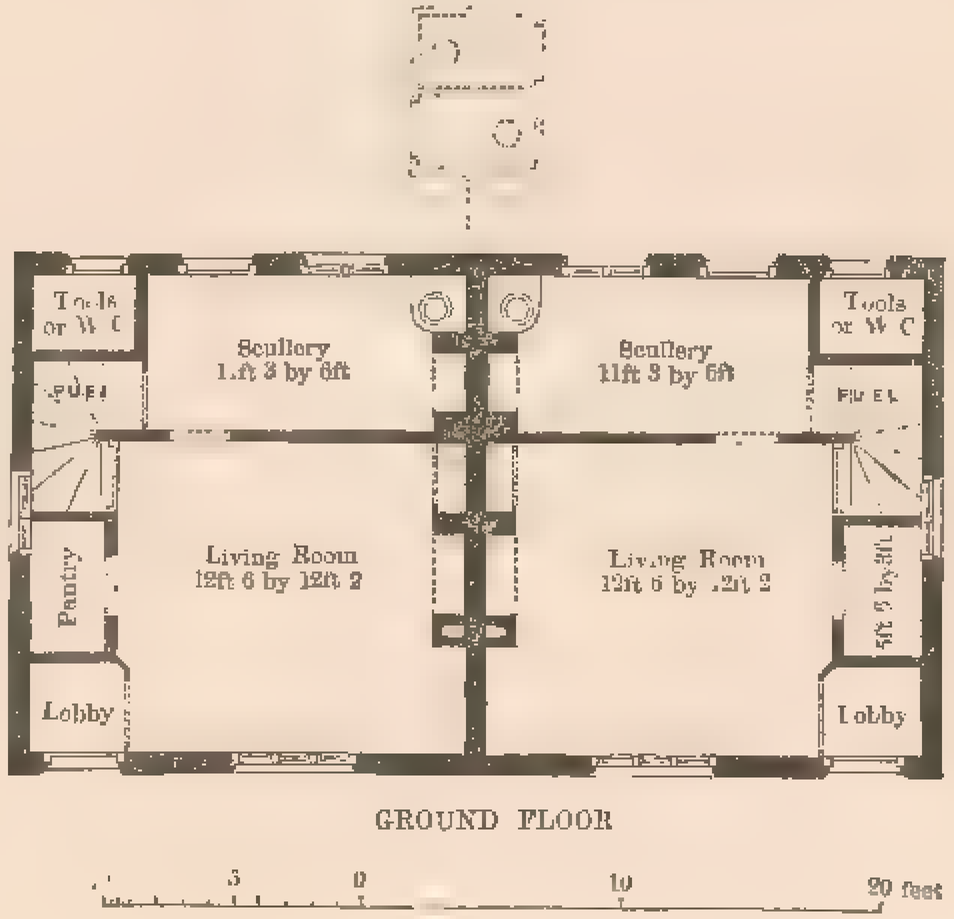
GROUND FLOOR PLAN.

WINDSOR ROYAL SOCIETY'S COTTAGES.

PLANS OF THE DOUBLE COTTAGES.

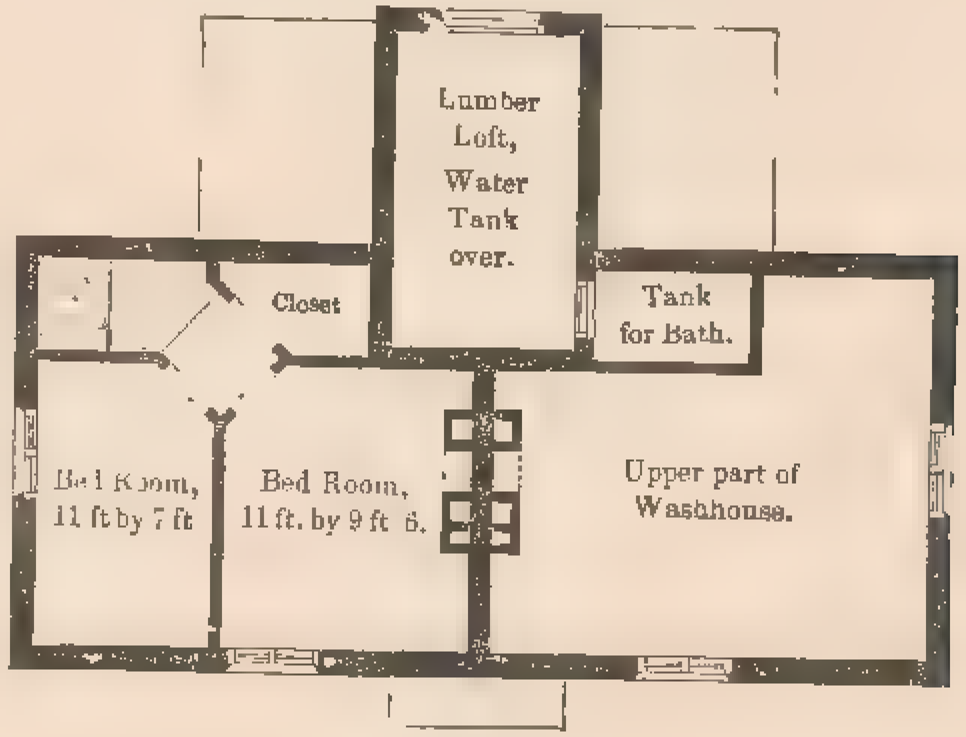


FIRST FLOOR.

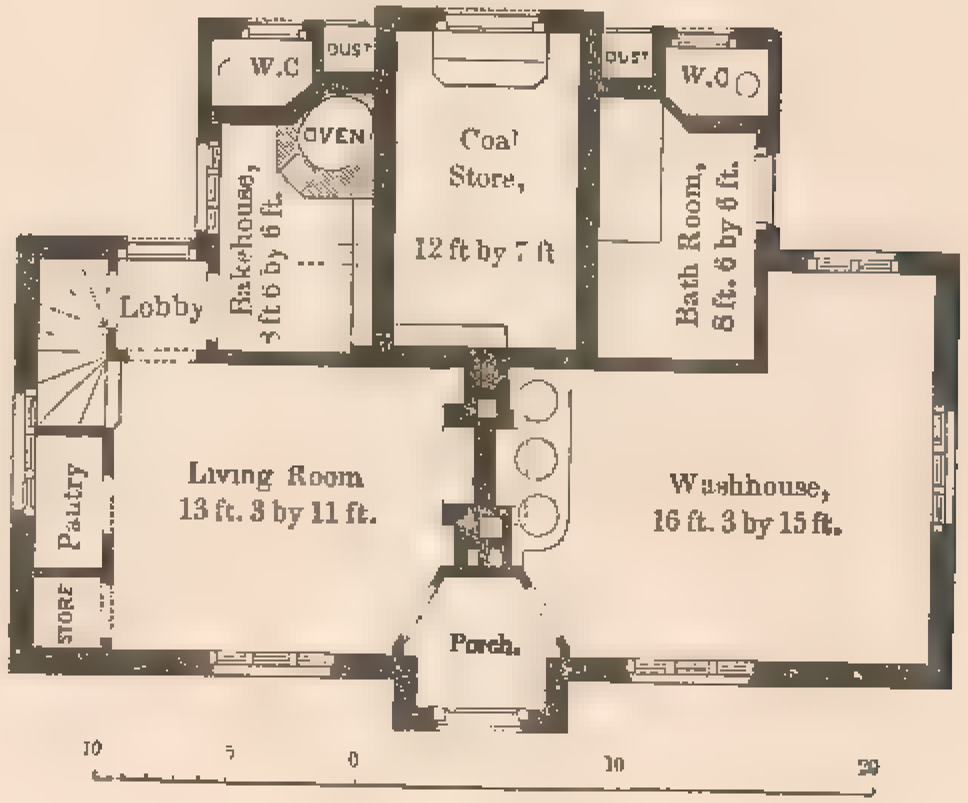


GROUND FLOOR

BUILDING WITH SUPERINTENDENT'S RESIDENCE, BAKEHOUSE, WASHHOUSE, BATH, FUEL STORE, AND TANK.



PLAN OF UPPER FLOOR.



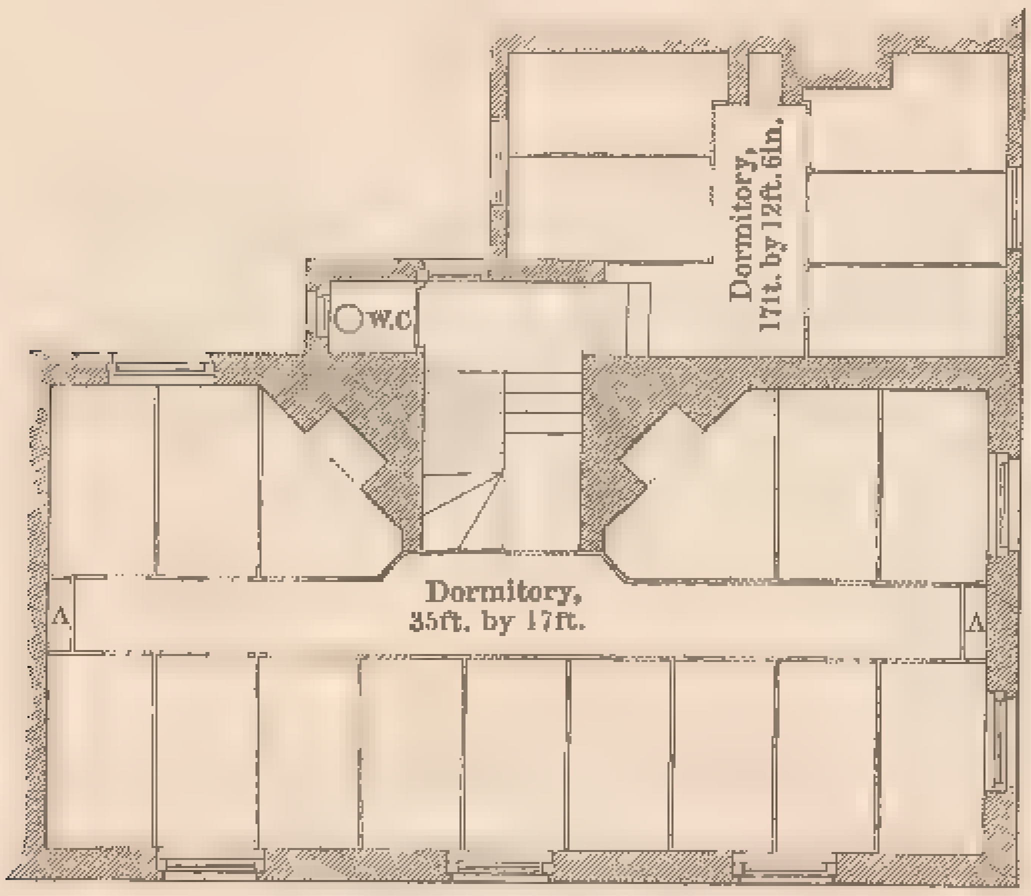
PLAN OF GROUND FLOOR.

NOTE.—The Elevation of these Cottages resembles that given for the Cottages, No. 4.

WINDSOR ROYAL SOCIETY'S MODEL LODGING HOUSE

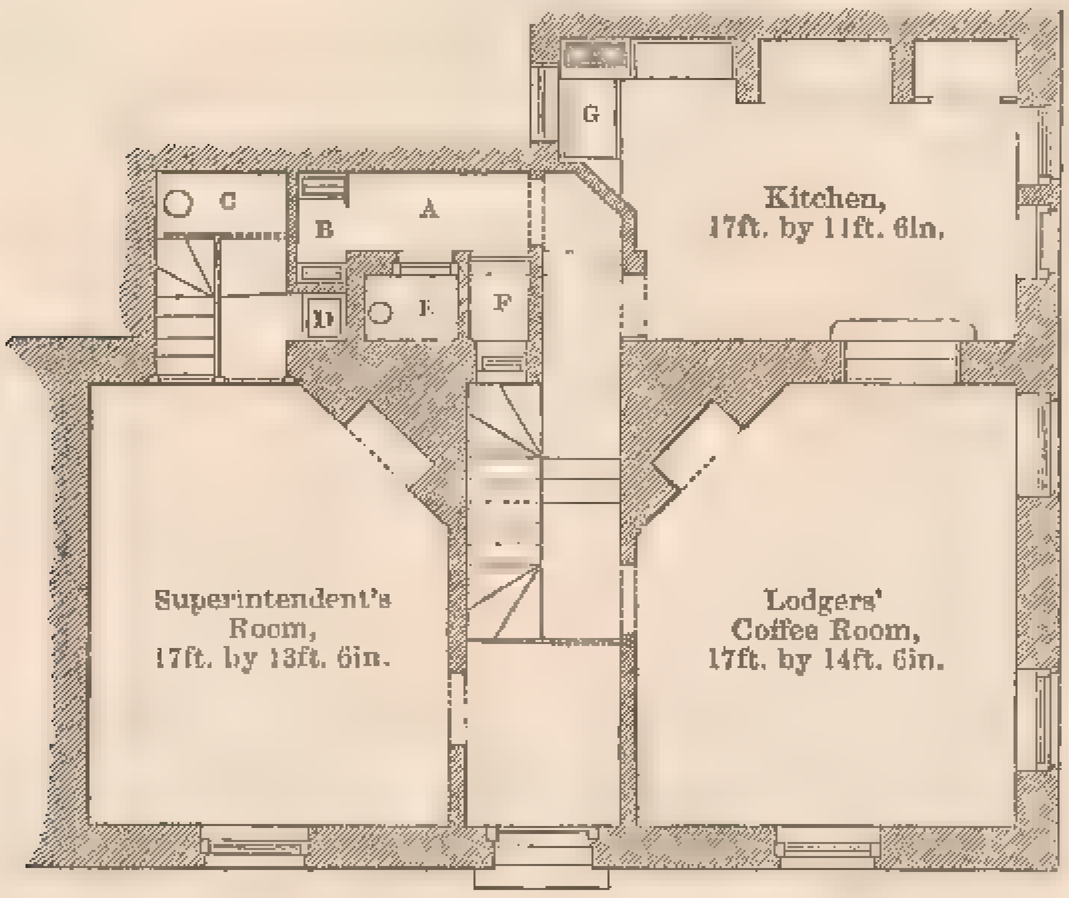
FOR 50 SINGLE MEN.

FIRST FLOOR PLAN.



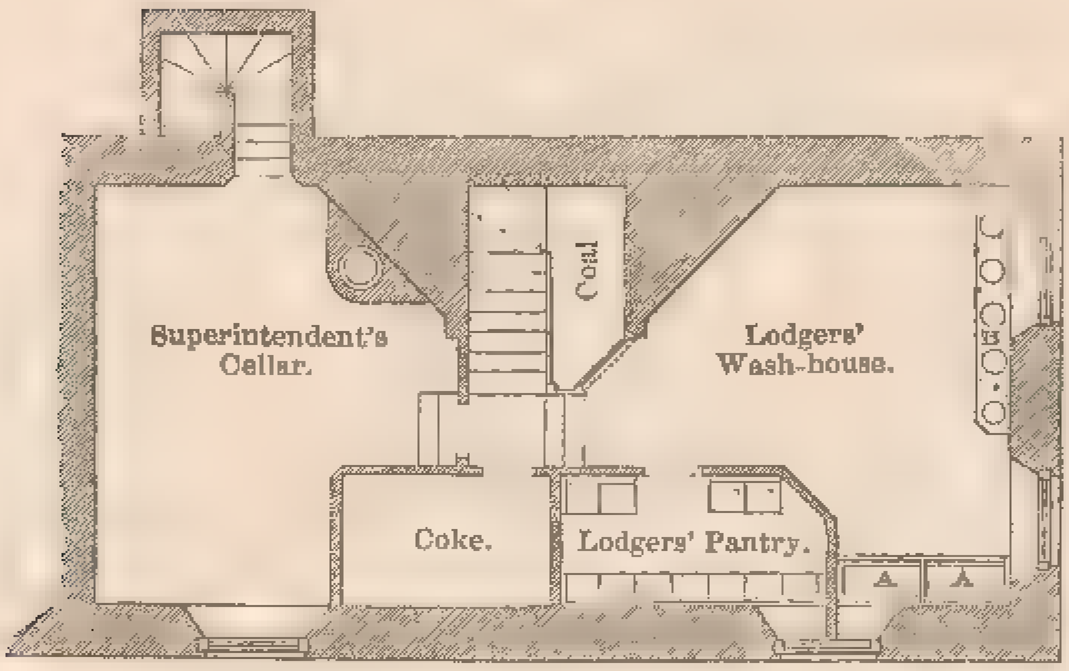
A Ventilating Shafts.

GROUND FLOOR PLAN.



A Yard.
B Urinals.
C Superintendent's W. C.
D Ditto Sink.
E Lodgers' W. C.
F Dust-bin.
G Sink.
H Plate-rack.

BASEMENT.



A Washing Troughs. B Washing Basins.

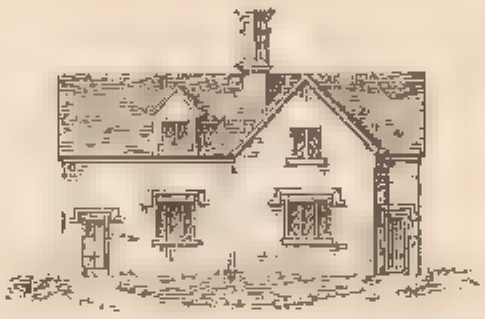
SUGGESTIONS FOR THE GROUPING OF COTTAGE TYPES


N° 2 or 5


N° 2 or 5


N° 2 or 5


N° 6


N° 2 or 5


N° 4

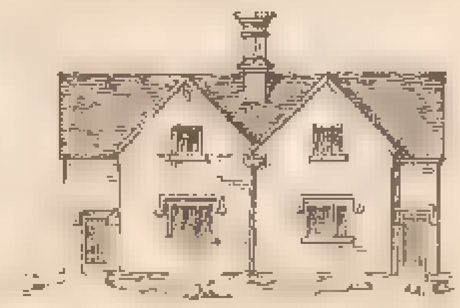

N° 2 or 5

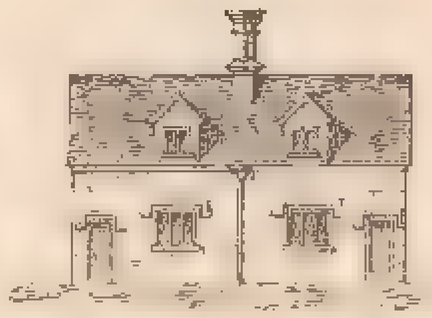

N° 2 or 5


N° 4


N° 2 or 5


N° 4


N° 6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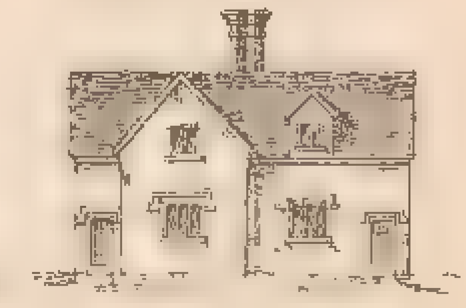

N° 2 or 5

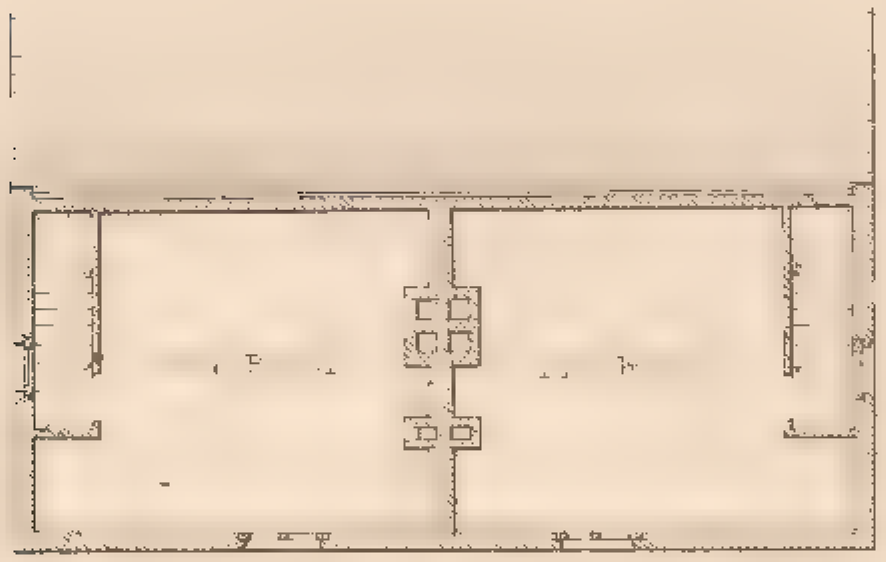
N°s 1 3 or 8 may be substituted for N° 6, and N° 7 for N° 4.

10 5 0 10 20 30 40 50 60 70 80 90 100 Feet

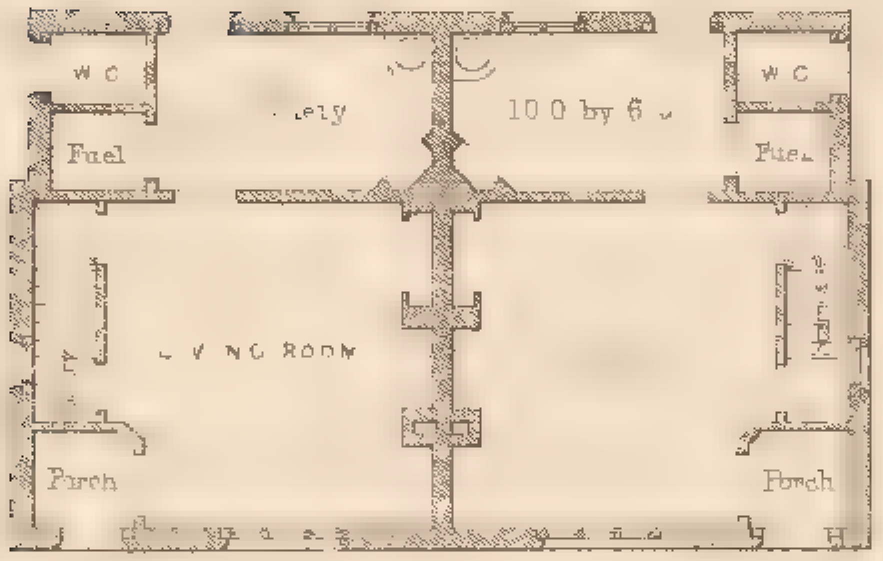
Day & Son, Lith^rs to the Queen.

Nº 1 DOUBLE COTTAGES WITH ONE BED ROOM

FRONT ELEVATION



UPPER FLOOR PLAN

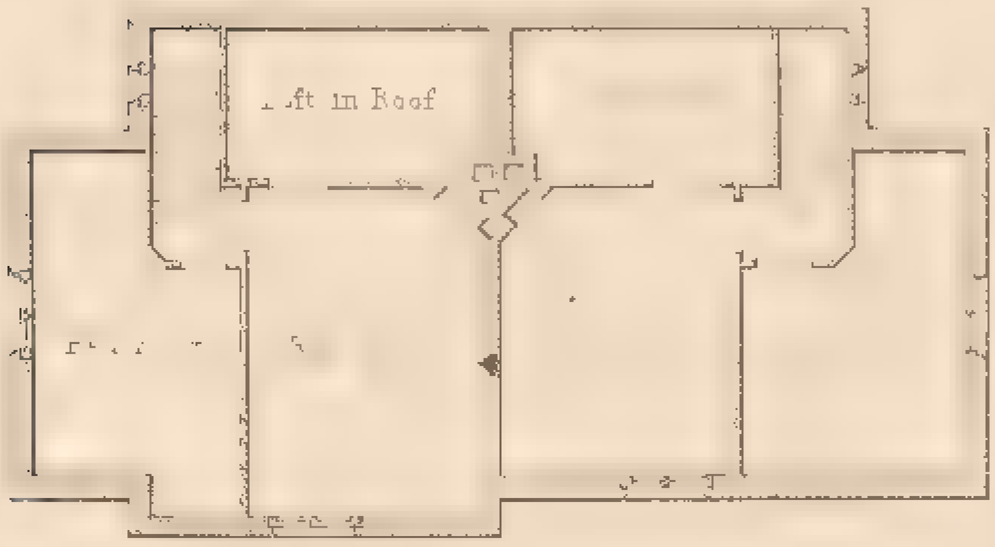


GROUND FLOOR PLAN

Day & Son Lithrs to the Queen

Nº 2 DOUBLE COTTAGES WITH TWO BED ROOMS

FRONT ELEVATION



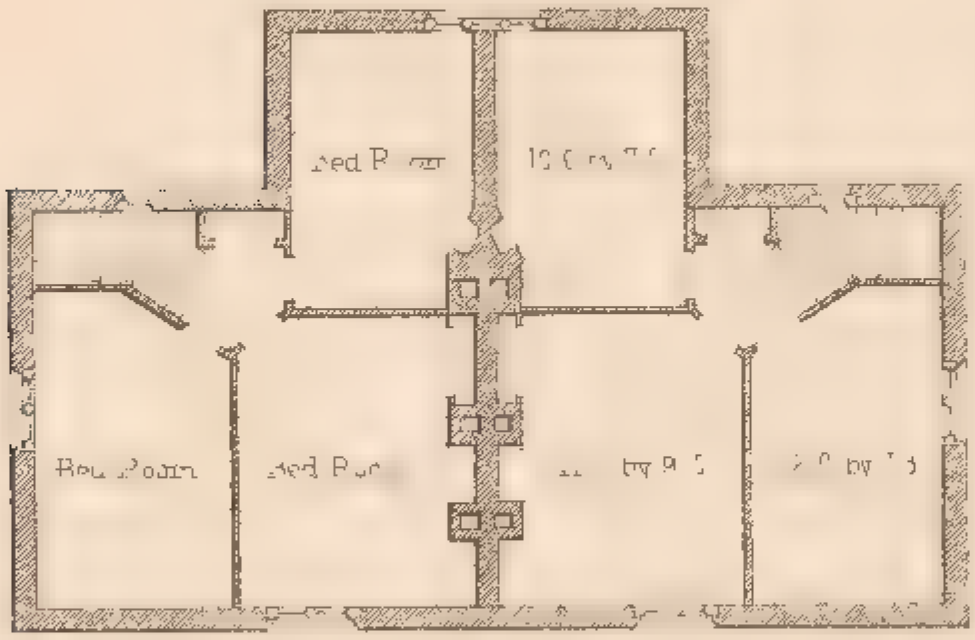
UPPER FLOOR PLAN

GROUND FLOOR PLAN

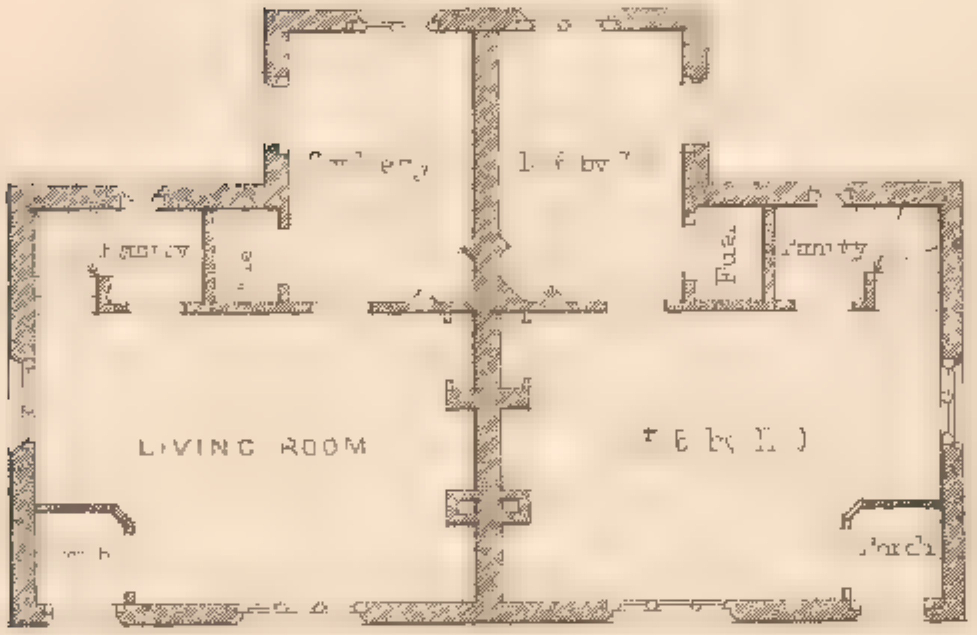
Day & Son Lith^{rs} to the Queen.

Nº 3 DOUBLE COTTAGES WITH THREE BED ROOMS

FRONT ELEVATION



UPPER FLOOR PLAN

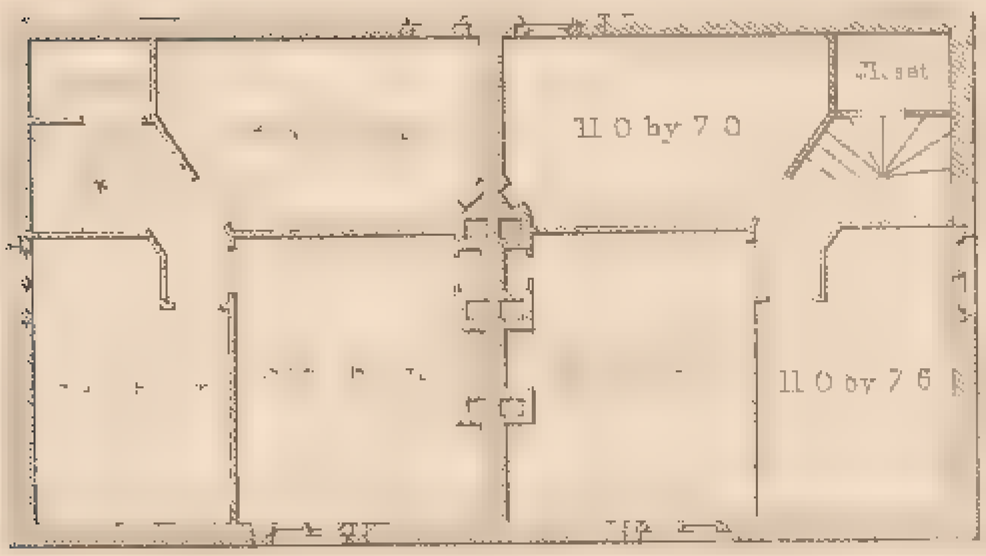


GROUND FLOOR PLAN

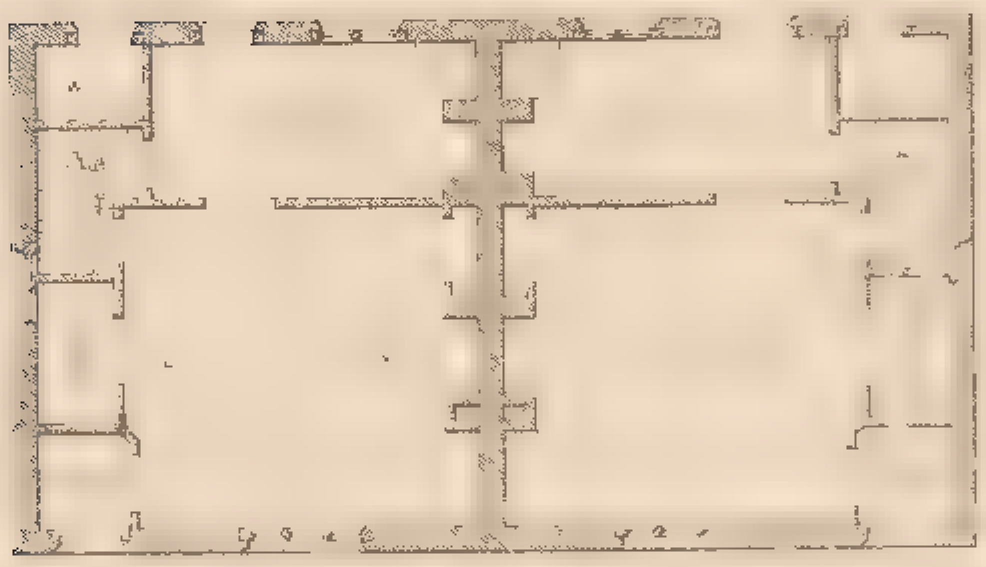
Day & Son, Lithʳˢ to the Queen.

Nº 4 DOUBLE COTTAGES WITH THREE BEDROOMS

FRONT ELEVATION



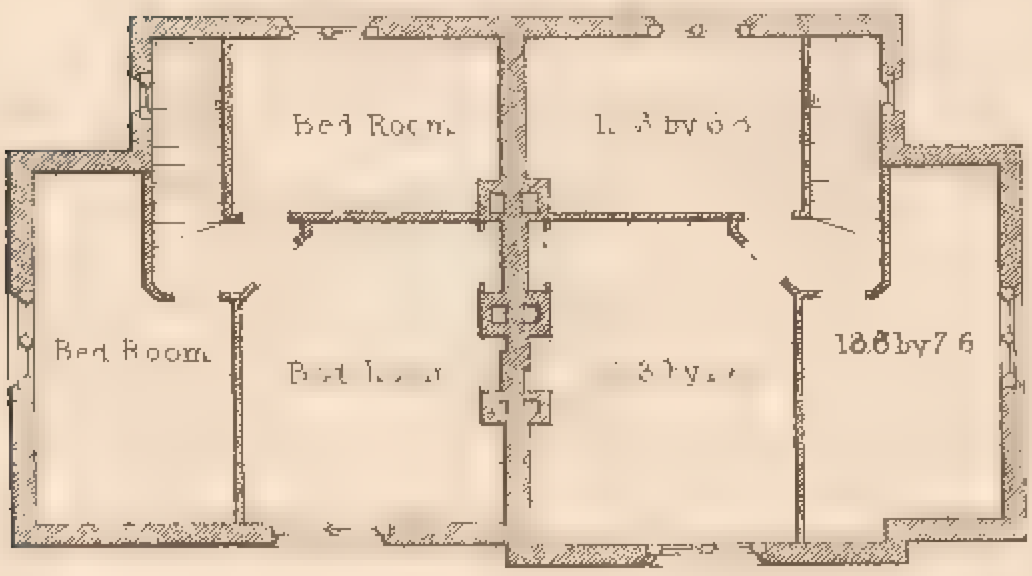
UPPER FLOOR PLAN



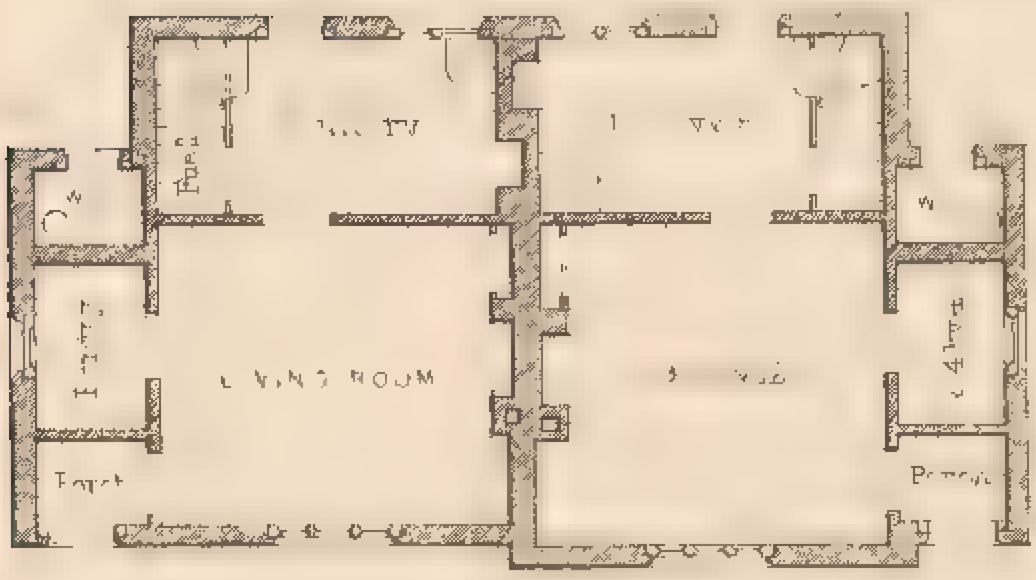
GROUND FLOOR PLAN

Nº 5 DOUBLE COTTAGES WITH THREE BED ROOMS

FRONT ELEVATION



UPPER FLOOR PLAN

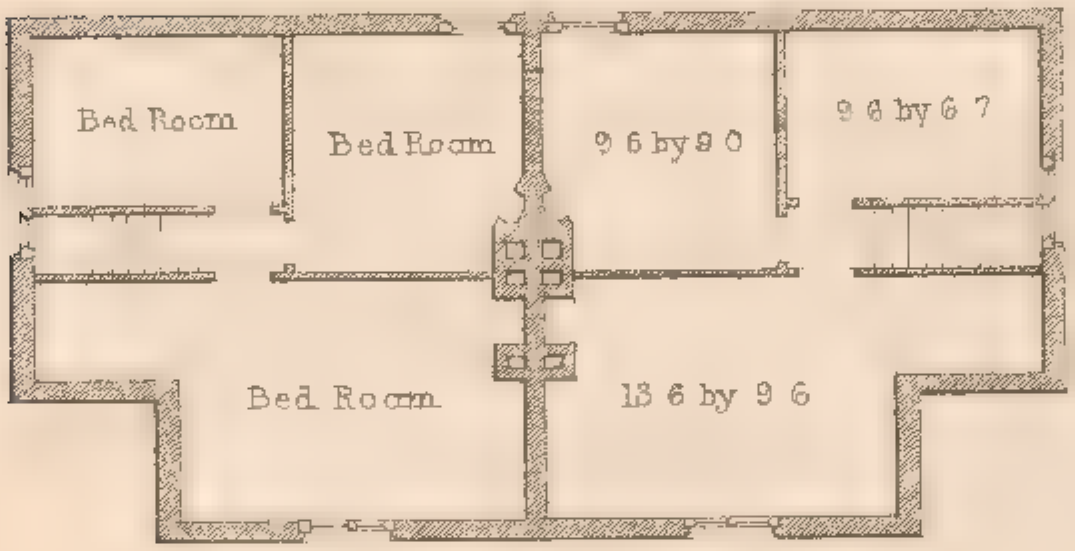


GROUND FLOOR PLAN

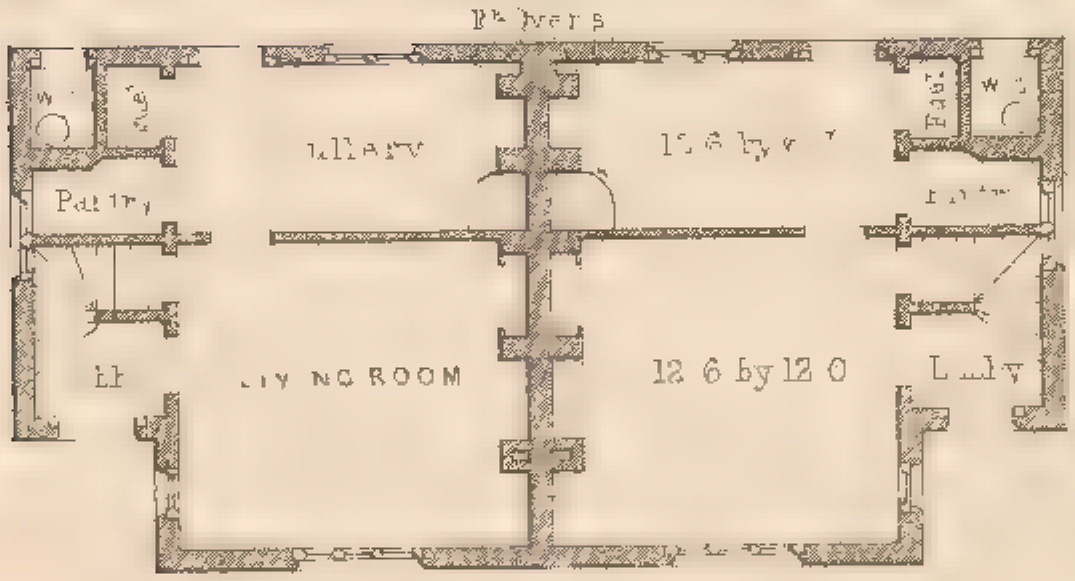
Day & Son, Lithrs to the Queen

Nº6 DOUBLE COTTAGES WITH THREE BED ROOMS

FRONT ELEVATION



UPPER FLOOR PLAN



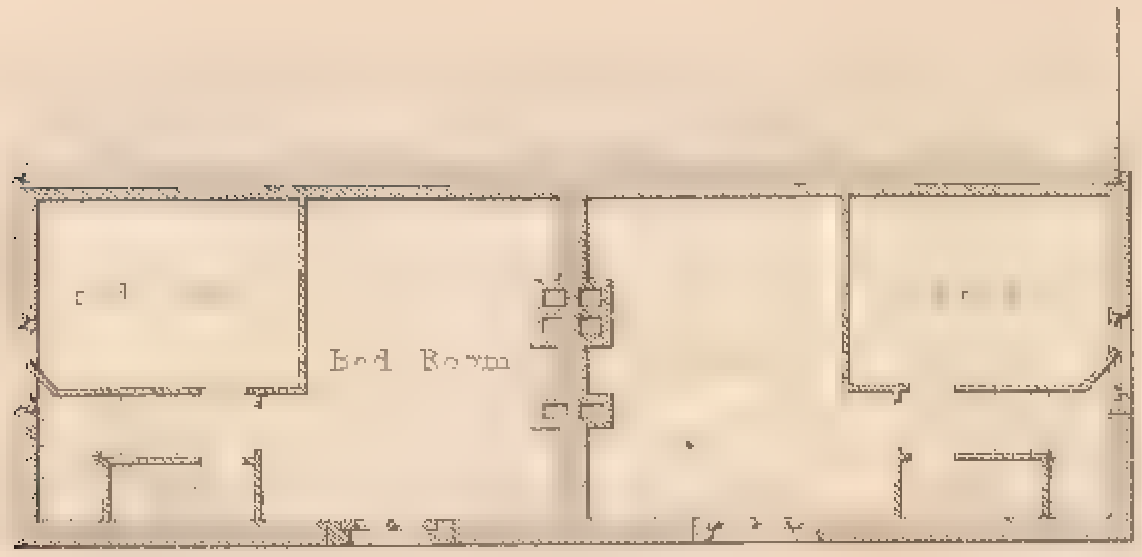
GROUND FLOOR PLAN

[illegible]

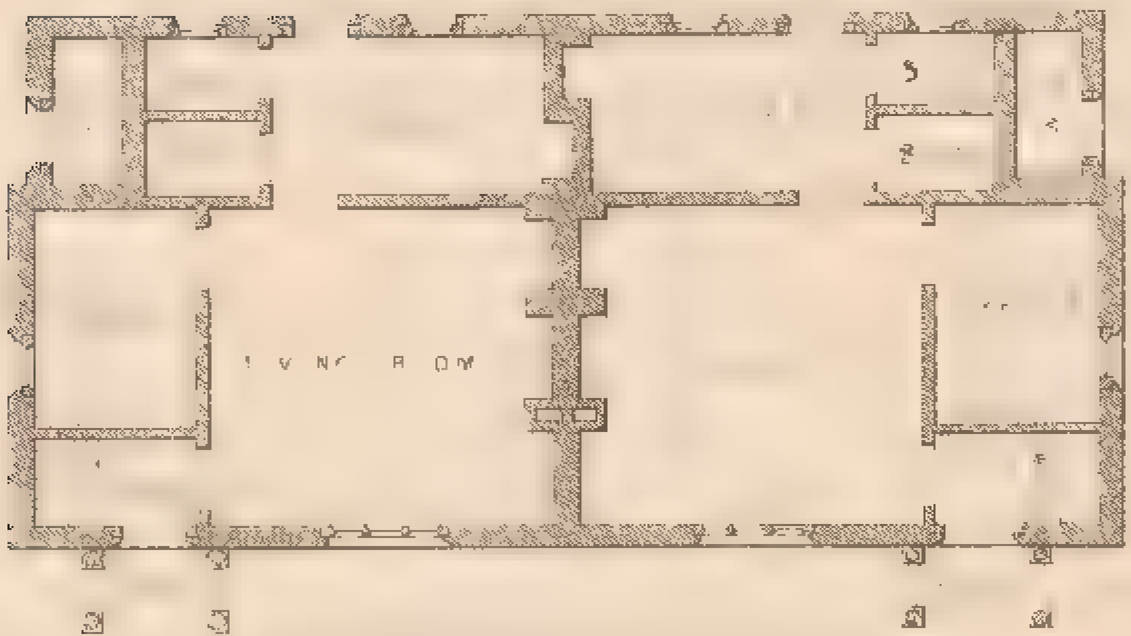
No 7 DOUBLE COTTAGES WITH THREE BED ROOMS

ONE ON GROUND FLOOR & TWO ON UPPER FLOOR

FRONT ELEVATION



UPPER FLOOR PLAN

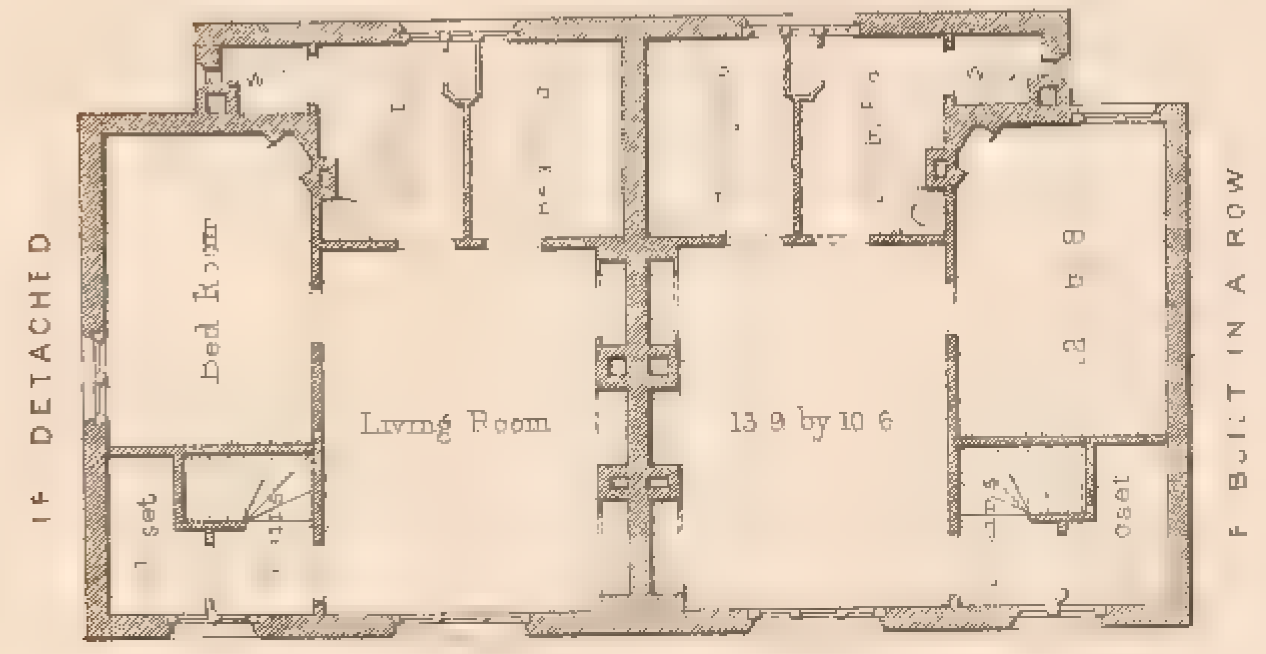


GROUND FLOOR PLAN

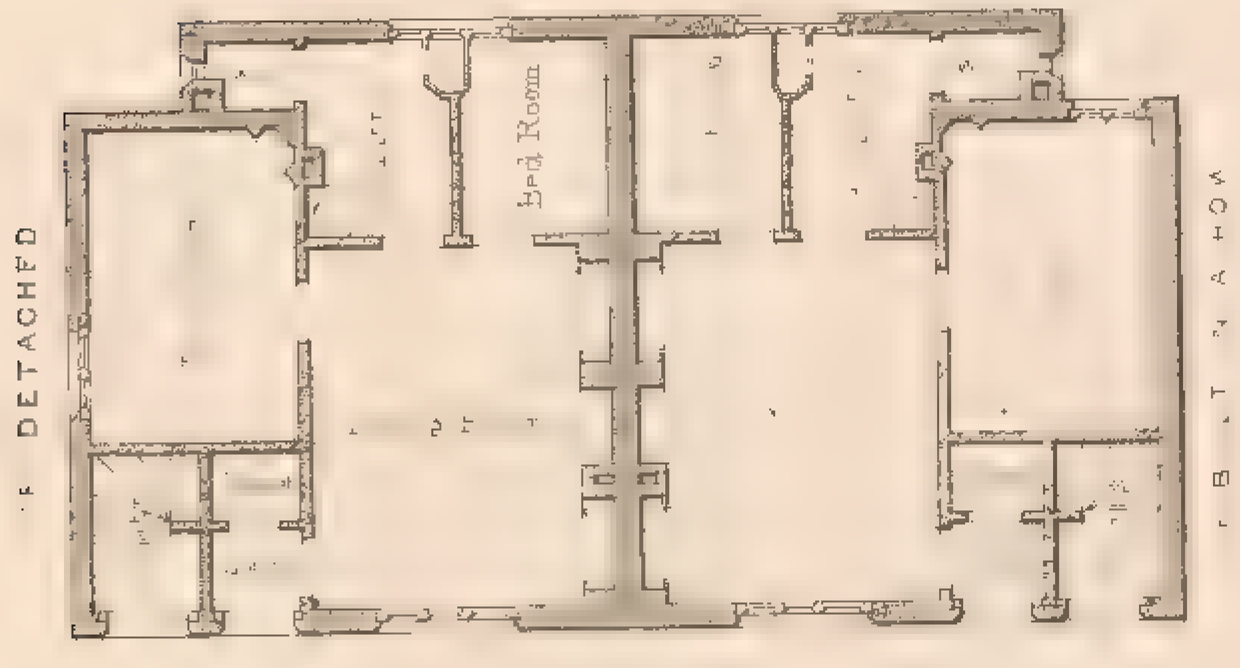
Day & Son lithrs to the Queen

Nº8 DOUBLE COTTAGES FOR TWO FAMILIES IN EACH

FRONT ELEVATION



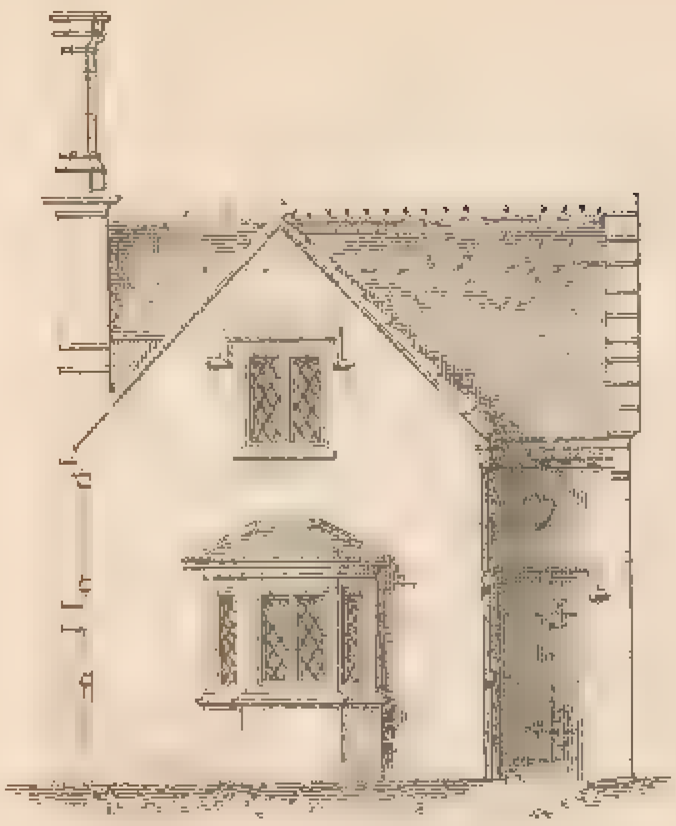
UPPER FLOOR PLAN



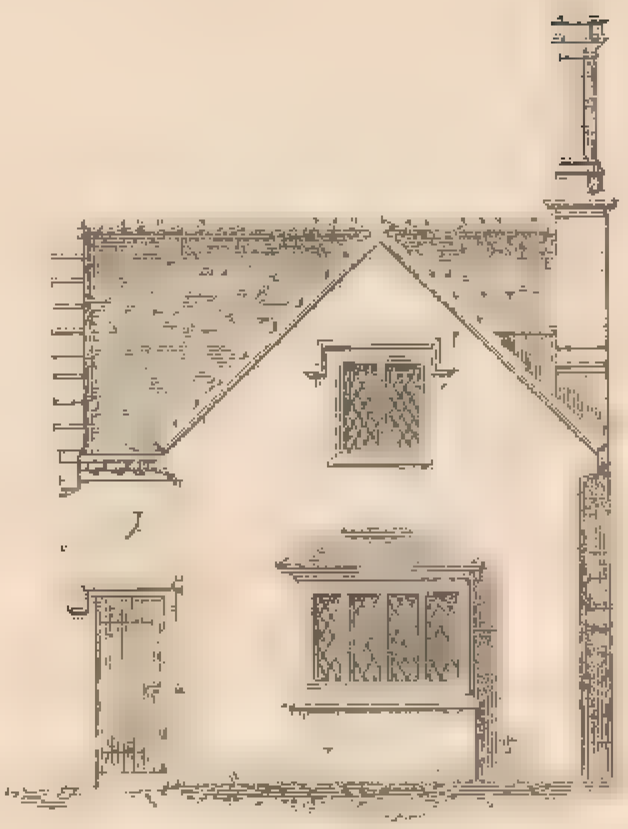
GROUND FLOOR PLAN

[illegible] Feet be added to the depth of these [illegible]
[illegible] ie may be taken from the large B.

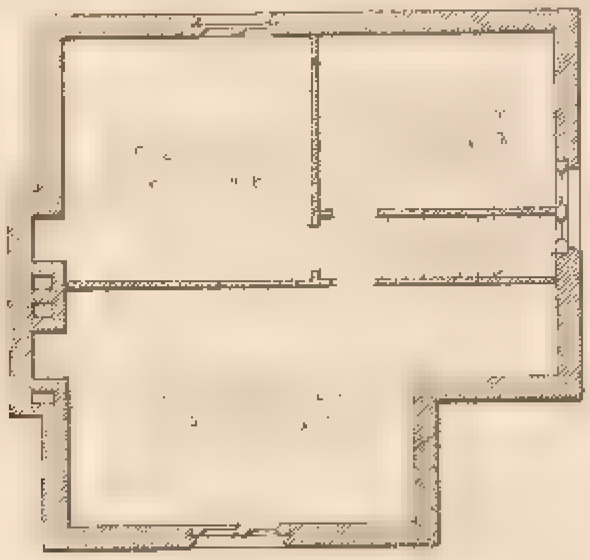
Nº 9. SINGLE COTTAGES SUITABLE FOR GATE LODGES



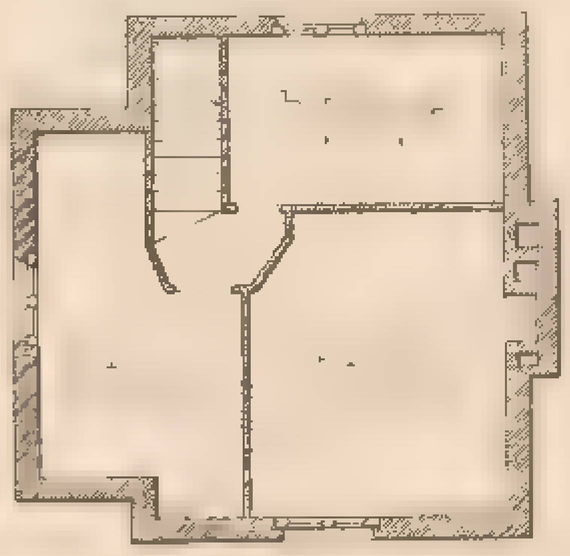
FRONT ELEVATION



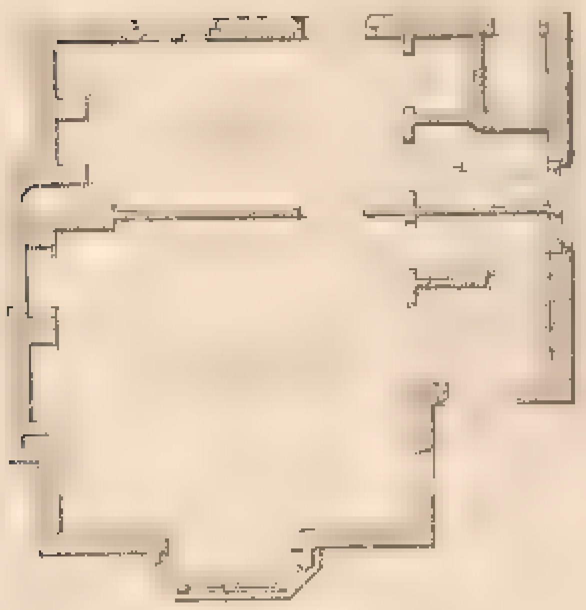
FRONT ELEVATION



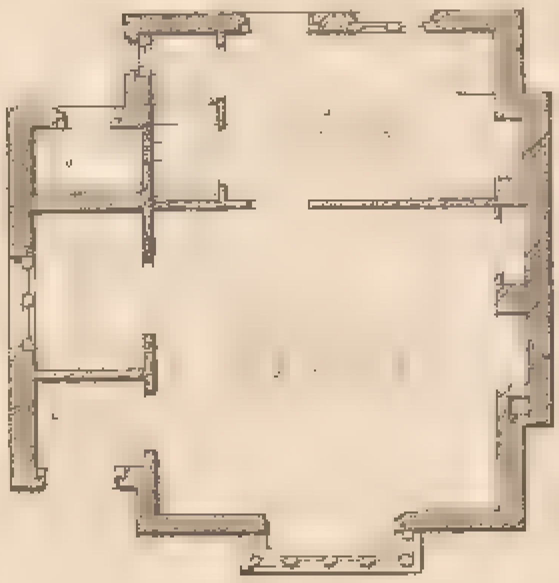
UPPER FLOOR PLAN



UPPER FLOOR PLAN



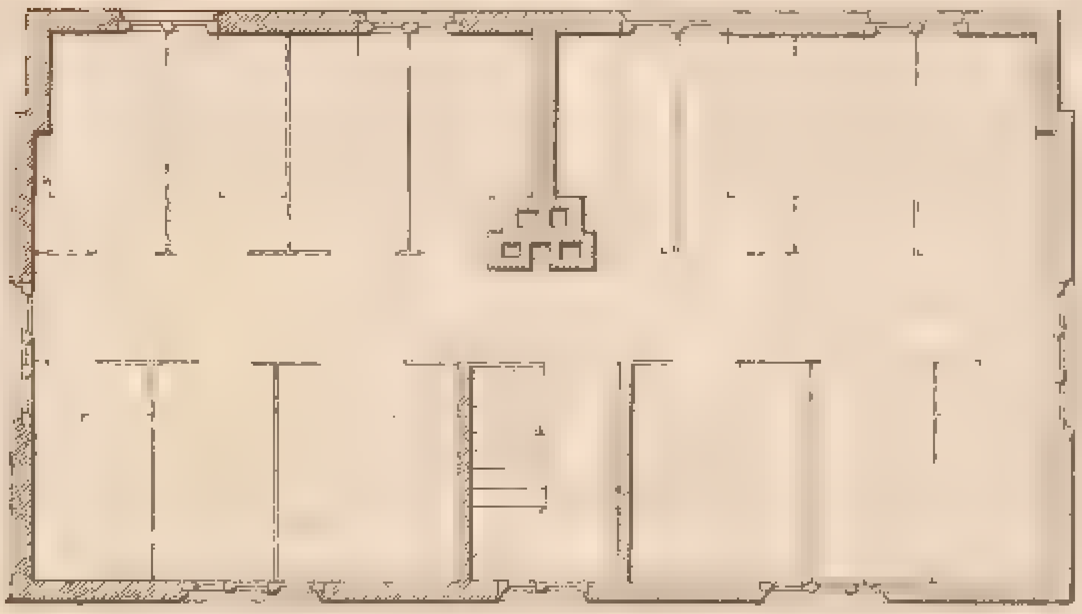
GROUND FLOOR PLAN



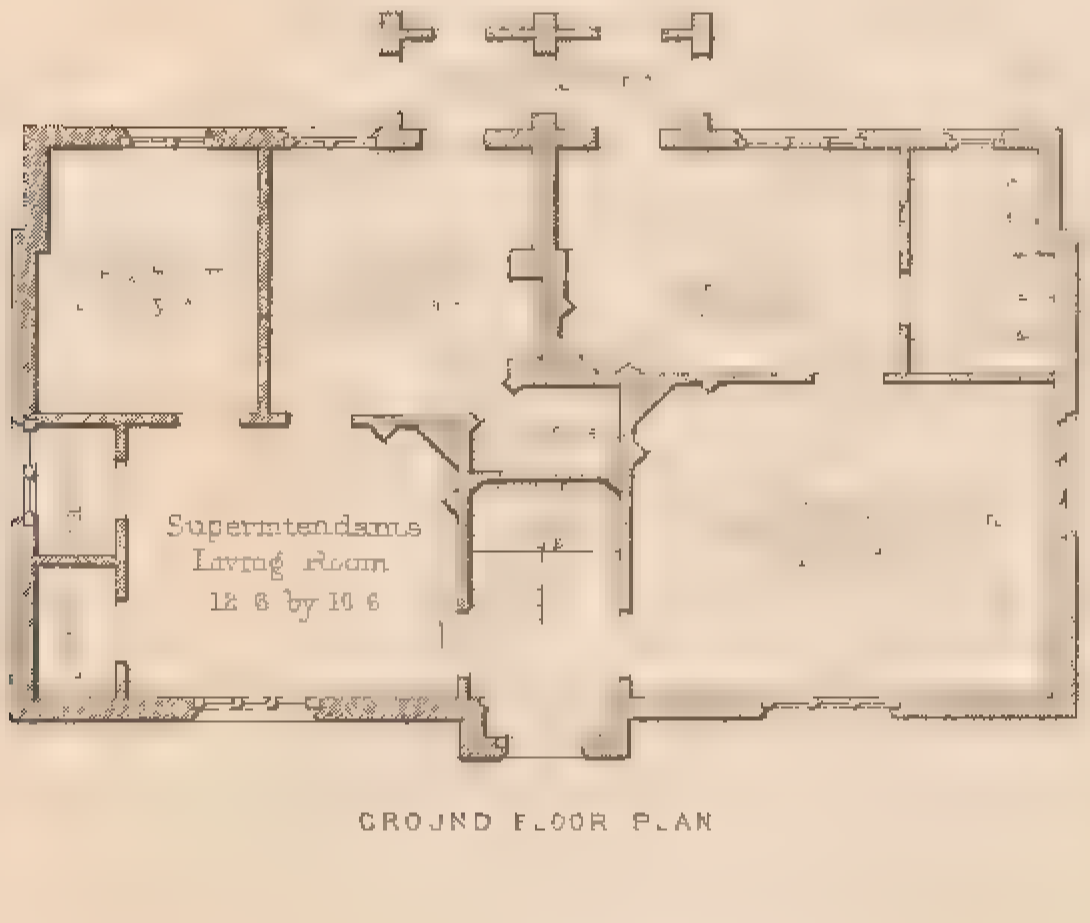
GROUND FLOOR PLAN

Nº 6 LODGING HOUSE FOR UNMARRIED LABOURERS

FRONT ELEVATION



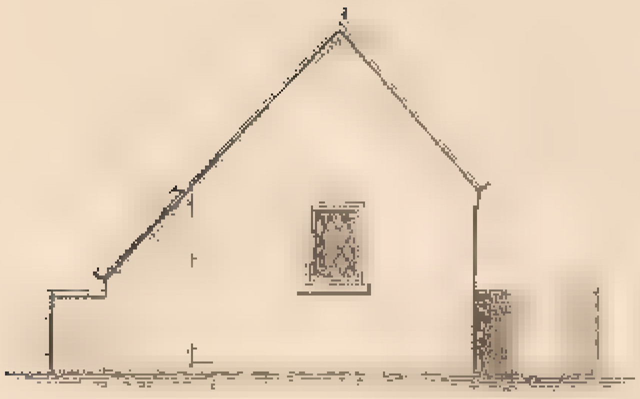
DORMITORY OR UPPER FLOOR PLAN



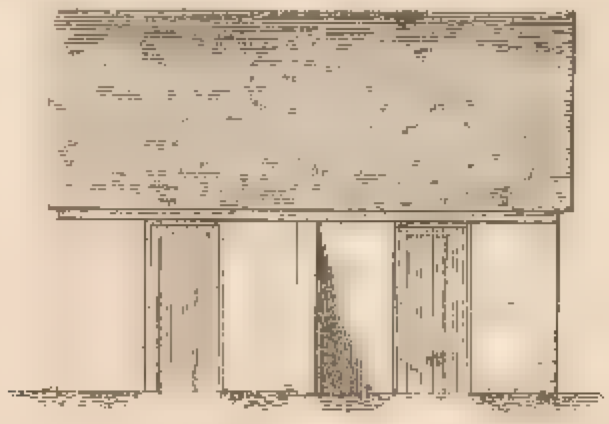
GROUND FLOOR PLAN

No 11. DOUBLE COTTAGES WITH FLINT FACING, BRICK QUOINS & COPING

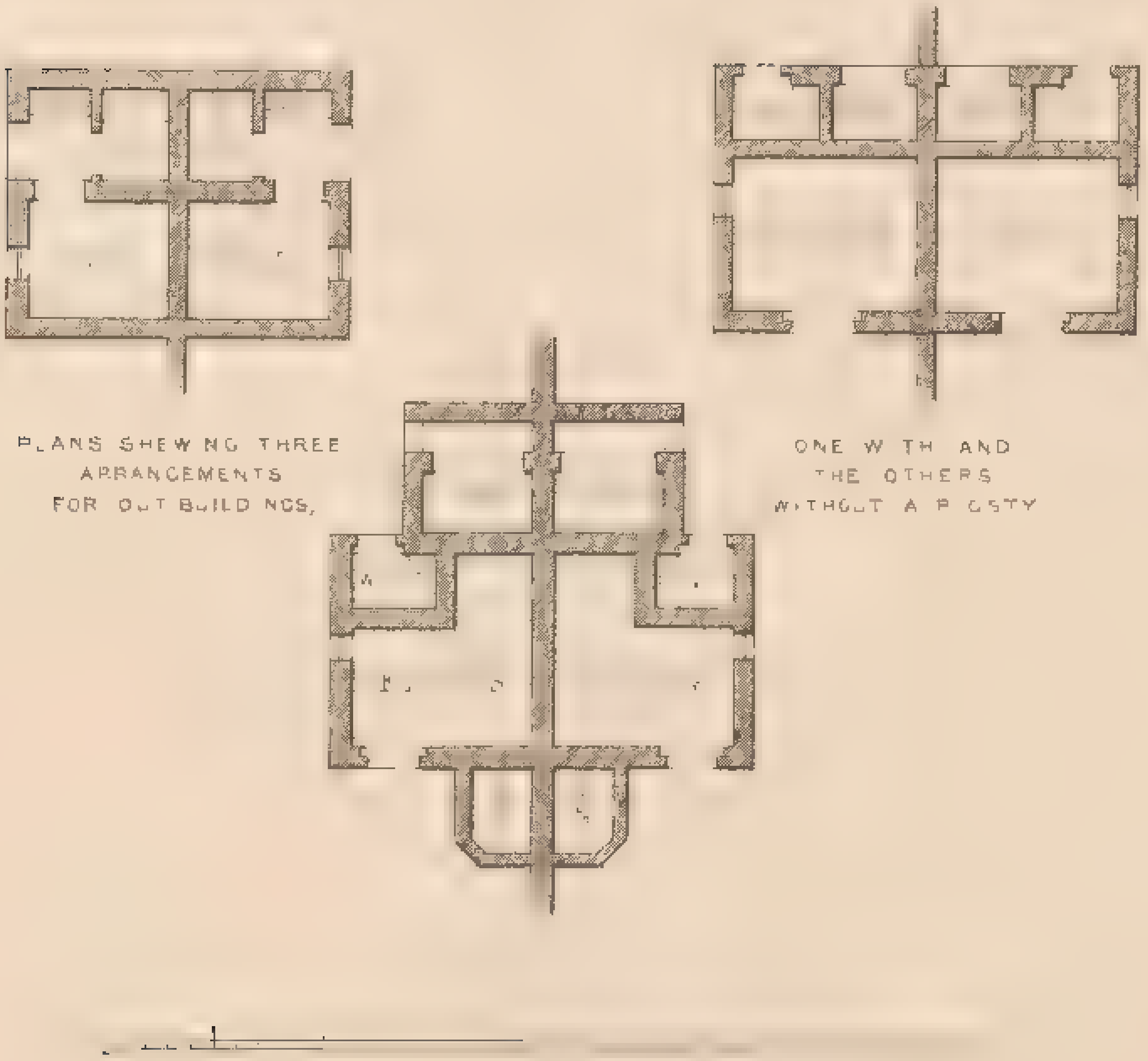
THE CHARACTER OF THIS ELEVATION IS APPLICABLE TO MOST OF THE PRECEDING DESIGNS



END ELEVATION OF LOWER DESIGN



SIDE ELEVATION



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